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ABSTRACT

Developed to assist primary school teachers who wish to implement LOGO and One-Key LOGO (OKL) in their schools, this document consists of a LOGO resource manual and 92 color-coded activity cards designed to guide a pre-reader or primary child through a series of problem solving steps. After a brief introduction, which contains computer terminology and procedures for computer care and operation, the resource manual is divided into sections which illustrate sample procedures and files found on the LOGO student utilities diskettes and present suggestions for their effective use. The contents include: (1) a sample OKL game; (2) a list of what students say they learn with LOGO; (3) troubleshooting tips for OKL; (4) directions for OKL commands; (5) troubleshooting tips for LOGO; (6) directions for LOGO commands; (7) off-computer activities for both LOGO and OKL; (8) sample worksheets for turtle activities; (9) class simulation activities; (10) definitions of LOGO headings and coordinates; (11) commands for LOGO color codes and numeric operations; and (12) LOGO and OKL management aides (OKL mazes and turtle games). Transparency masters are included for some games. (JB)

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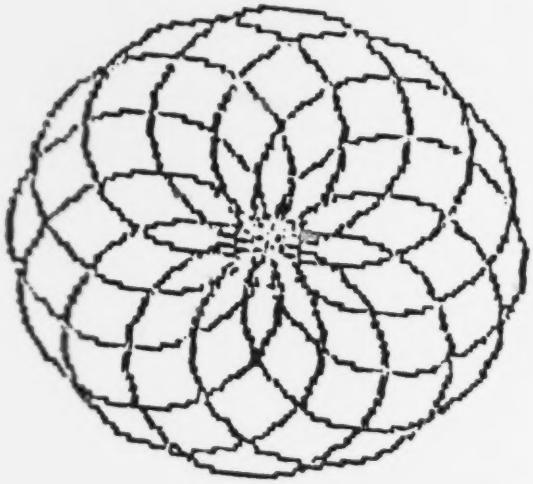

One Key Logo

ITV Services
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July 1984

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Foreword

Recently I observed the first group of nursery-school children working with a computer on an extended version of LOGO and a real-time text-editing system developed over the past few years through a collaboration between our research group at MIT and Texas Instruments. A four-year old girl (I shall call her Robin) was working with some dynamic graphics programs that allowed her to make shapes appear on the screen, move, change color, and stick together by pushing one or another of some fourteen keys on the keyboard. The plan was that when Robin was tired of using a program she would ask the teacher to set up a new program. And this is in fact what she did for the first few times. But then Robin took charge of the whole process and began typing the control characters necessary to interrupt a program she no longer wanted and typing the names of the programs she did want, even though this was at a measured rate of about two characters per minute. In breaking out of the role of dependence on adults, Robin symbolized the fact that computers will enable children to break out of many of the roles into which technological primitivity and social custom have cast them. (Seymour Papert, Project LOGO, M.I.T. from BYTE Publications Inc., Sept. 1980)

In order to aid schools in providing students opportunities to become acquainted with and use computers at an early age, the Nebraska Department of Education-ITV Services presents LOGO and One-Key LOGO for primary students.

This manual has been designed for use by teachers wishing to implement LOGO and One-Key LOGO in their schools.

The program was designed by Chuck Friesen, Kathy Parker and Jerry Shedlosky of the Lincoln Public Schools and the rights to the programs have been purchased by the Nebraska Department of Education-ITV Services.

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COMPUTER INTRODUCTION . . . . . LITERACY REVIEW

I. HARDWARE (parts)

Video -- TV monitor

Keyboard -- similar to typewriter

CPU (computer) -- central processing unit which quickly adds, subtracts or compares information

Disk Drive -- machine to read or write information to be used with computer

II. TERMS

Disk -- magnetic storage unit

Program -- set of instructions to tell the computer what to do

Bug -- mistake in program

Cursor -- blinking square which shows where the next character will be typed

III. CARE

1. All plugs should be tight in their sockets.
2. Avoid pollution -- no drinks, food, chalk dust fall-out.
3. Disks should be kept in dust covers except when in use.
4. Never touch shiny, exposed part of disk through holder's windows.
5. Hold disk by labeled edge - label side up. (That edge is the last into the disk drive.)
6. Do not lay disks on top of video or disk drive when computer is in use.

IV. PROCEDURE TO START

1. Turn on video.
2. Insert disk in disk drive.
3. Rub finger on switch plate on back of unit to remove static electricity from body.
4. Turn switch "on."
5. Disk drive will whirr and clack with the red light on.
6. After red light is off and cursor appears on screen:
   a) Select option from MENU.
   b) If no menu appears, type CATALOG, then type RUN Program Name you choose.
   c) For Krell LOGO programs, follow the directions on page 2.

V. PROCEDURE TO END

Turn off the computer with switch at back of computer, remove disk from disk drive and put in cover, and turn off video.

STUDENT UTILITIES DISKETTE CONTENTS

The procedures found on the Nebraska Department of Educations LOGO Utilities diskette were designed or modified for use in the LOGO curriculum. Each file stored on the diskette contains procedures. They must be read into the work space of the computer. These files and procedures will be described below. In addition, suggestions will be given as to how they might be effectively used.

In order to work with any of the LOGO Utilities procedures, you must already be in the LOGO environment. Upon having loaded the LOGO language into the computer, replace the LOGO DISKETTE in the disk drive with the Utilities diskette. You may wish to catalog the diskette to view the names of the many files on this diskette. The Nebraska Department of Educations Utilities will be the last ones to be listed. A file will need to then be read into the computer and then a procedure will need to be executed. In most cases, the file and procedure names are identical.

The steps necessary to successfully execute programs found on the Nebraska Department of Education Student Utilities Diskette are listed below:

1. Insert LOGO Diskette in disk drive.
2. Turn on the computer and monitor.
3. Wait at least 45 seconds for LOGO to be loaded into the computer.
4. Take out the LOGO Diskette.
5. Place the Utilities Diskette in the disk drive.
6. Catalog the diskette (optional step).
7. Read a file from the diskette.
8. Execute a procedure in memory.

The files on the Utilities diskette will be described in detail on pages 3-9.

NEBRASKA DEPARTMENT OF EDUCATION UTILITIES DISKETTE CONTENTS

1. OKL

File To Be READ: `? READ "OKL`

PROCEDURE TO BE EXECUTED: `? OKL`

OKL stands for One Key Logo. OKL has been designed to introduce LOGO to primary students. Students working with OKL are required to only enter single keystrokes into the computer. In LOGO students are often required to enter commands of up to 5 keystrokes. Since primary students have very limited typing skills, OKL provides an environment in which they too can be successful. Their lack of keyboard skills will not prevent them from meaningful LOGO activities.

2. GUESSØ9Ø

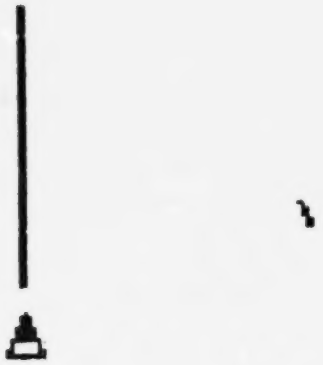
File To Be READ: `? READ "GUESSØ9Ø`

PROCEDURE TO BE EXECUTED: `? GUESSØ9Ø`

GUESSØ9Ø is a game in which students are asked to estimate the measure of angles ranging from Ø degrees to 9Ø degrees. (NOTE: the word GUESSØ9Ø contains two zeros and does not contain any "ohs." By typing "ohs" one will receive "file not found" message.)

There is only one way to exit this game: Type a CONTROL - G. Since this is an estimation game, answers within 4 degrees of the actual angle will be counted as correct. Emphasis should not be placed upon "getting the exact answer." Students, of course, should be encouraged to guess the measure of an angle in as few tries as possible. The student will work on each randomly selected problem until they successfully answer it.

A sample game follows.



A target appears to the right of the vertical segment. An angle will be formed by the vertical segment and another segment starting from the turtle's position and, hopefully, passing through the target.

The first guess is 55 degrees. TYPE '55' and press RETURN.

How many degrees? 55

The estimated angle measure of 55 degrees was not quite large enough. Thus, our next guess will be 61.

Try again, PLEASE.
PRESS SPACE BAR TO CONTINUE.

To clear the screen and guess again, press the space bar.

How many degrees? 61

An angle of 61 degrees is formed and it does pass through the target area. The angle measure which would cause the angle to be formed through the center of the target is also given. By pressing the space bar the student will receive a new problem.

Awesome! You guessed 61.
It actually was 63.

PRESS SPACE BAR TO CONTINUE.

The student will continue to receive randomly selected problems with answers between 0 and 90, inclusive. To exit the program, type CONTROL-G.

3. GUESS180

File to be READ: ? READ "GUESS180

PROCEDURE TO BE EXECUTED ? GUESS180

This game is similar to GUESS090 as described above. However, angles and answers will range from 0 to 180 degrees.

4. GUESS360

File To Be READ: `? READ "GUESS360`

PROCEDURE TO BE EXECUTED: `? GUESS360`

This game is similar to GUESS090 as described above. However, angles and answers will range from 0 to 360 degrees.

5. MUSICDEMO

File To Be READ: `? READ "MUSICDEMO`

PROCEDURE TO BE EXECUTED: `? SETUP`

By executing SETUP, a binary file named MUSIC.BIN is read into the computer. This will allow for sound or music to be heard when executing any of the four songs contained in the MUSICDEMO file. If you do not execute SETUP prior to executing one of the procedures listed below, you will enter the monitor and see "weird" things on the screen. There are two ways to restore peace and tranquility. First, type CONTROL-Y, Press return, then type SETUP and press return. If that fails you will need to start from the very beginning and reload the LOGO program into the computer. Then you will need to again read the MUSICDEMO program into memory.

PROCEDURE TO BE EXECUTED: ? LUKE
PROCEDURE TO BE EXECUTED: ? HAPPY
PROCEDURE TO BE EXECUTED: ? YANKEE
PROCEDURE TO BE EXECUTED: ? TWINKLE

The four songs found in MUSICDEMO ARE:

LUKE (Star Wars theme)
HAPPY (Happy Birthday)
YANKEE (Yankee Doodle)
TWINKLE (Twinkle, Twinkle, Little Star)

6. PRINTER

File To Be Read: `? READ "PRINTER`

PROCEDURE TO BE EXECUTED: `? PRINTER`

This program will allow you to print the picture on the LOGO graphics screen. You must have the PRINTER procedure in the work space prior to generating a picture on the screen. Of course you must make sure the PRINTER is turned on. Once the picture is on the screen, type CONTROL-G if you are in the middle of a procedure; then type PRINTER and press return. Answer each of the questions and press RETURN. The picture will be printed by "Rows." You will need to be patient since it will take the printer some time to print graphics screen on paper.

7. CIRCLES

File To Be Read: `? READ "CIRCLES`

PROCEDURE TO BE EXECUTED: `? CR 20`

`? CL 30`

The names of two procedures found in the file CIRCLES are CL (circle left) and CR (circle right). Each procedure needs an input. For instance, in CR 20, the 20 is in the input. The input must be a number. It represents the radius of a circle.

The command CR 20 will cause a circle of radius 20 to be drawn. The Turtle will curve to the right in constructing the circle. CL 30 will be represented on the screen by a circle of radius 30. The Turtle will curve to the left when drawing the circle.

LARC and RARC are additional procedures found in the file CIRCLES. Each will draw a quarter of a circle. Both require an input. The input represents the radius of the circle of which the ARC is a part.

8. SHOOT

File To Be READ: | ? READ "SHOOT |

PROCEDURE TO BE EXECUTED | ? MENU |

SHOOT is a game in which students are asked to estimate: (a) angle measures, and (b) lengths of segments.

The procedure MENU presents these three options:

1) POSITIVE ANGLES
2) NEGATIVE & POSITIVE ANGLES
3) QUIT

If Option One is chosen, angles with measures ranging from Ø to 9Ø will be randomly selected. Option Two will present angles with measures ranging from -9Ø to 9Ø.

After selecting Options One or Two, a figure similar to the one below will appear on the screen. A circle and a Turtle will appear on the screen. The challenge is to direct the Turtle to "land in the circle." In order to do this one must enter: (a) a number to represent the angle. One side of the angle is formed by a vertical line passing through the Turtle (just as it was in GUESSØ9Ø) and (b) a number representing the distance the Turtle is to travel in the direction of the entered angle.

At what angle? 6Ø — Press RETURN after entering 6Ø.
How far? 1ØØ — Press RETURN after entering 1ØØ.

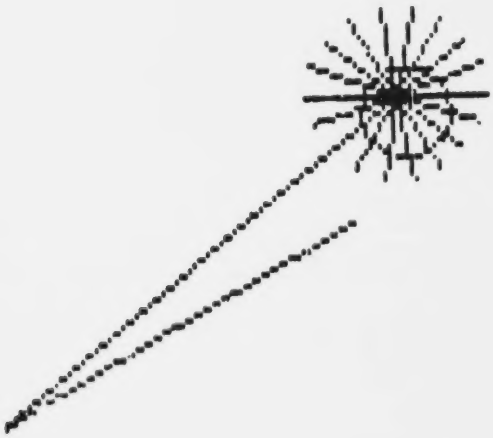
The results of entering an angle of measure 60 and a distance of 100 are shown at the left. Obviously, the angle is too large and the distance is too small.

Missed! Shot Number 1

The program continues in this fashion until the target has been hit. Angle and distance must be again entered. The previous estimates are visible to help in determining the next estimate.

At what angle? 50
How far? 115

LAST ANGLE: 60
LAST DISTANCE: 100



An angle of 50 and a distance of 115 will place the Turtle within the circle. Success has been achieved on the second try. A minor "explosion" appears on the screen.

CONGRATULATIONS. YOU HIT THE TARGET.
It took you only 2 shots.

The screen will then be cleared and a new target will be randomly placed on the graphics screen. The student will be required to enter angles and distances until the target is hit. After correctly "hitting" five (5) targets, the original MENU is again presented. Option Three will allow you to exit the program. NOTE: The other method of exiting the program consists of typing CONTROL-G at any time while in the program.

9. PSAVE

File To Be READ: `? READ "PSAVE`

PSAVE is a command that allows part of the work space to be saved in a file on a diskette. (NOTE: The command SAVE will save the entire work space as the indicated file name.)

When might you wish to use PSAVE? Suppose you have nine (9) procedures in the memory of the computer. Assume they are named: P1, P2, P3,..., P9. If we wish to save procedures P1, P5 and P8 on our diskette as a package named "NEWPROJECTS" we may do so by typing the following:

```
?PSAVE "NEWPROJECTS [P1  P5  P8]
```

10. WAIT

File To Be READ: `? READ "WAIT`

FILE TO BE EXECUTED `? WAIT 600`

WAIT allows a time delay to be entered into a LOGO procedure. WAIT 600 will cause the program to delay for about 10 seconds. WAIT 60 will cause a time delay of approximately 1 second. WAIT always needs a positive integer as an input.

WHAT LOGO STUDENTS SAY THEY LEARN

* About problem solving and estimation.
* About thinking and learning styles.
* About how to use their own learning style.
* To think logically.
* To work without emotional manipulation--the computer doesn't care if you feel angry.
* To use procedural thinking.
* To use strategies for problem solving.
* To become confortable thinking mathematically.
* To be able to think geometrically.
* To be able to consider laws of motion.
* About language by creating my own system for naming procedures.
* About graphics and design.
* How important revision of procedures and text is, and how simple it is to do.
* That decimals are useful.
* How to type.
* How to be patient.
* How to take risks in working.

The most significant things they claim to have learned include:

* Looking at their own mistakes with an interest in understanding what happened instead of shame.
* Feeling competent in setting their own problems and supported in solving them.
* Understanding that learning and doing involve frustration and ease.

TROUBLE SHOOTING OKL

1. Insert KRELL'S LOGO disk.
   Turn on computer. Wait for ? ▨

2. Insert Student Utilities disk.

3. Type READ "OKL Wait for ? ▨

   If you forgot Step 2, the disk drive will continue to run with no results. Hold down [CTRL] while you type G; then go back and complete Step 2.

4. Type OKL

5. Type N before each new picture.

6. To empty work space for a fresh start, hold down [CTRL] while you type G. Type GOODBYE.
   Then do steps 3 and 4.

Hold down control key.

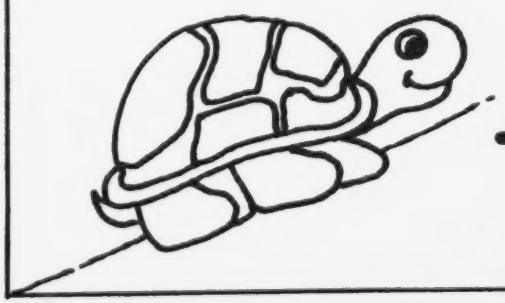
7. To leave OKL, type [CTRL] G . . . or turn off computer

Error Messages	Solution
STOPPED:, . . .	Step 4
THERE IS NO PROCEDURE NAMED . . .	Type GO. ON [RETURN]
THERE IS NO PROCEDURE NAMED OKL (Make sure CAPS LOCK key is down on the Apple IIe.)	Steps 3 and 4
* ▨ (or no cursor)	Type: [CTRL] Y [RETURN] or Steps 1, 2, 3, and 4
NO STORAGE LEFT:	Step 6

Hi. I am the OKL Turtle.

You make me follow my nose.

N new	H hide turtle	Q undo
F forward	S see turtle	E erase
R right	U pen up	O small circle
L left	D pen down	2 medium circle
B back	M move to middle	3 big circle
	T tell	A ask



ONE KEY LOGO

To Save Pictures to a Disk for a FLAG

Have Turtle draw a picture on the screen.

(FLAG is the example we will use.

You may save the picture by any name which starts with a letter - not a number - and does not contain spaces, i.e., MARY.SMITH.FLAG)

CTRL G Hold down the control key while you type G.
You will get a STOPPED: message.

? SAVEPICT "FLAG RETURN DISK Drive will run.

? OKL RETURN You will be back to One Key Logo.

ONE KEY LOGO

To Read Pictures from a Disk

CTRL G and then CTRL T

? CATALOG RETURN In the catalog you will see: B 034 FLAG.PICT.

CTRL S or CTRL F

? READPICT "FLAG RETURN Disk drive will run.

The whole picture of the flag will "bleed" onto the screen.

? OKL RETURN You will be back in One Key Logo

ONE KEY LOGO

To Save Procedures to a Disk for a FLAG

Have Turtle draw a flag on the screen.

Type T

FLAG [RETURN]

(You may use any one word for the name for the procedure. It must start with a letter and cannot contain spaces.)

Type A

FLAG [RETURN]

[CTRL] G Hold down the control key, while you type G.
You will get a STOPPED: message.
Now you will be in regular LOGO.

? SAVE "FLAG [RETURN]

Picture disappears. Disk drive will run.

? OKL [RETURN] You will be back to One Key Logo.

ONE KEY LOGO

To Read Procedures from a Disk

[CTRL] G and then [CTRL] T

? CATALOG [RETURN]

In the catalog you will see: B 002 FLAG.LOGO

? READ "FLAG [RETURN] Disk drive will run.

? OKL [RETURN] You will be back in One Key Logo.

Type A

FLAG [RETURN] The Turtle will draw a flag.

PRINTING A PICTURE

Any picture produced on the screen can be printed on paper if a printer with a graphics interface card is attached to the computer. The Decwriter printer will not print the graphics screen. The smaller dot matrix printers should be able to print graphics screens.

Follow these directions:

1. Place a picture on your screen.
   You can use OKL to draw a picture or use READPICT to retrieve a picture saved on your diskette.

2. Turn on the printer. Have paper in position in the printer and the "SEL" light on.

3. Hold down the CTRL key while you type G .

4. Type PRINTER RETURN .

5. Answer each question and press RETURN
   The picture will be reproduced on paper.

6. Wait to advance the paper until the printer stops.

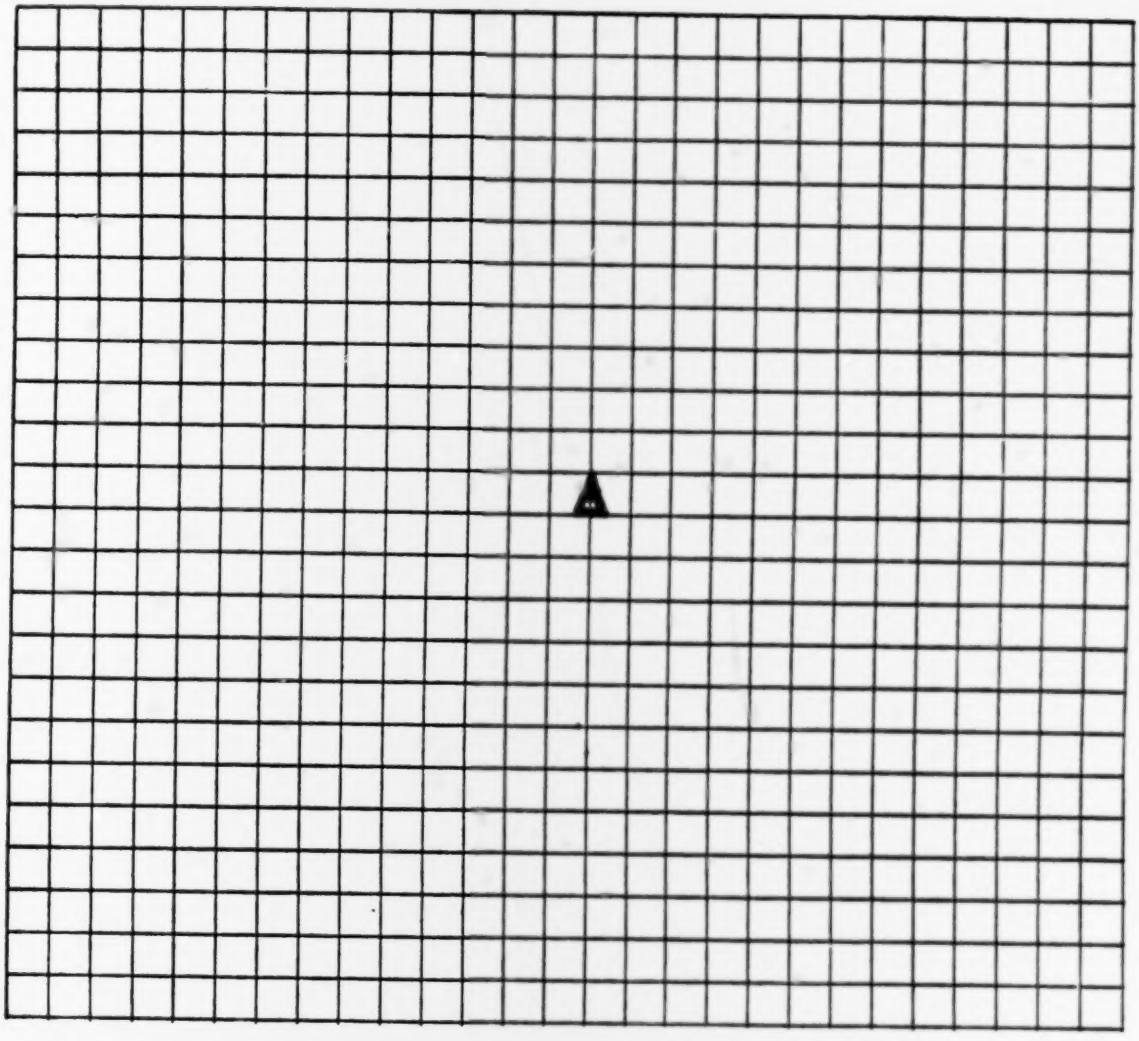
7. If you want another copy of the same picture, adjust the paper in the printer, put "SEL" light back on, and return to step 5.

or type OKL RETURN to continue drawing.

TURTLE COMMANDS

I typed . . .	Turtle did . . .

OKL
One Key Logo



1. Plot a picture.
2. Plan a program.

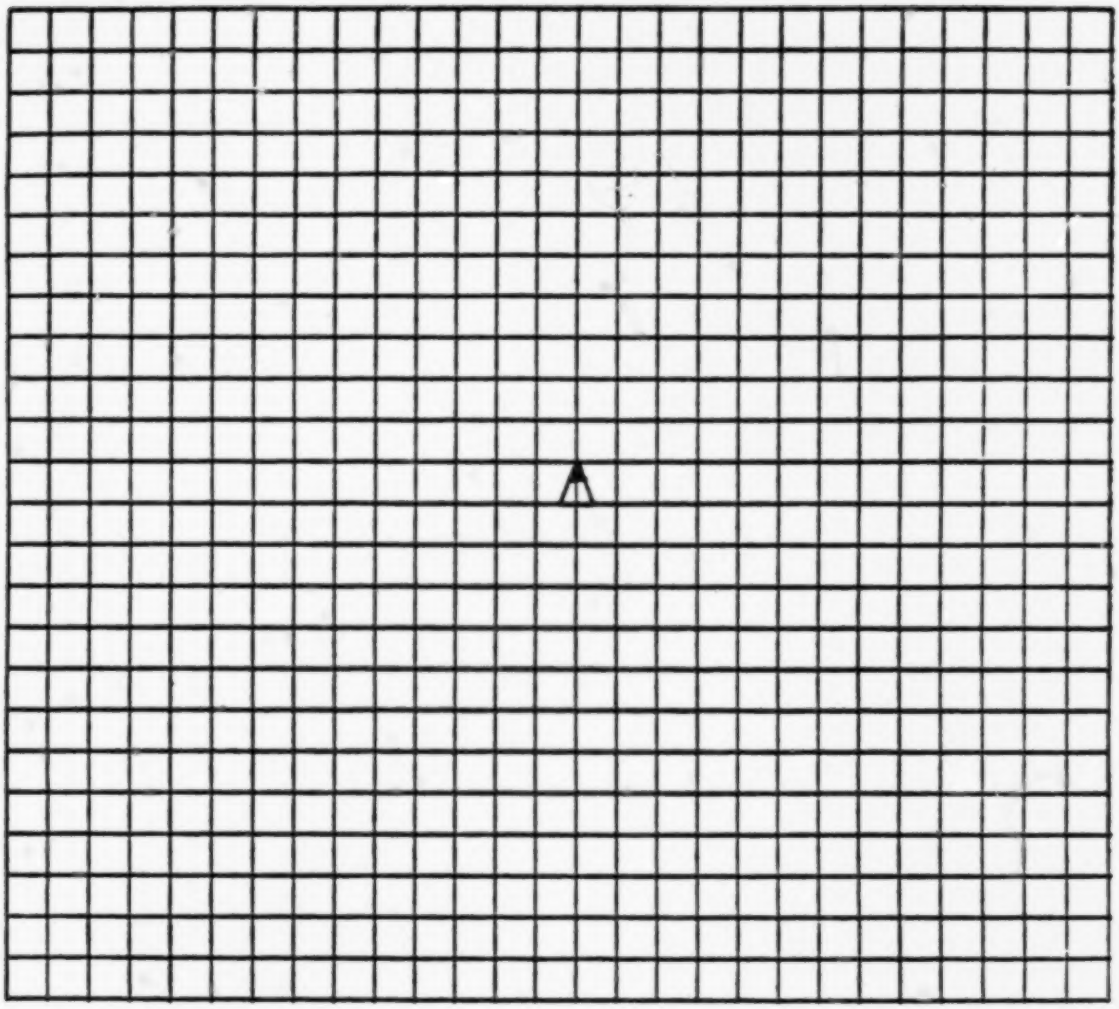
---

3. Type it.
4. Bugs out.

What will Turtle draw?

FFFF RRR FF RRR FFF LLL FFFF LLL FFF
RRR FF RRR FFFF FFFF RRR FF RRR FFF
LLL FFFF LLL FFF RRR FF LLL BBBB H

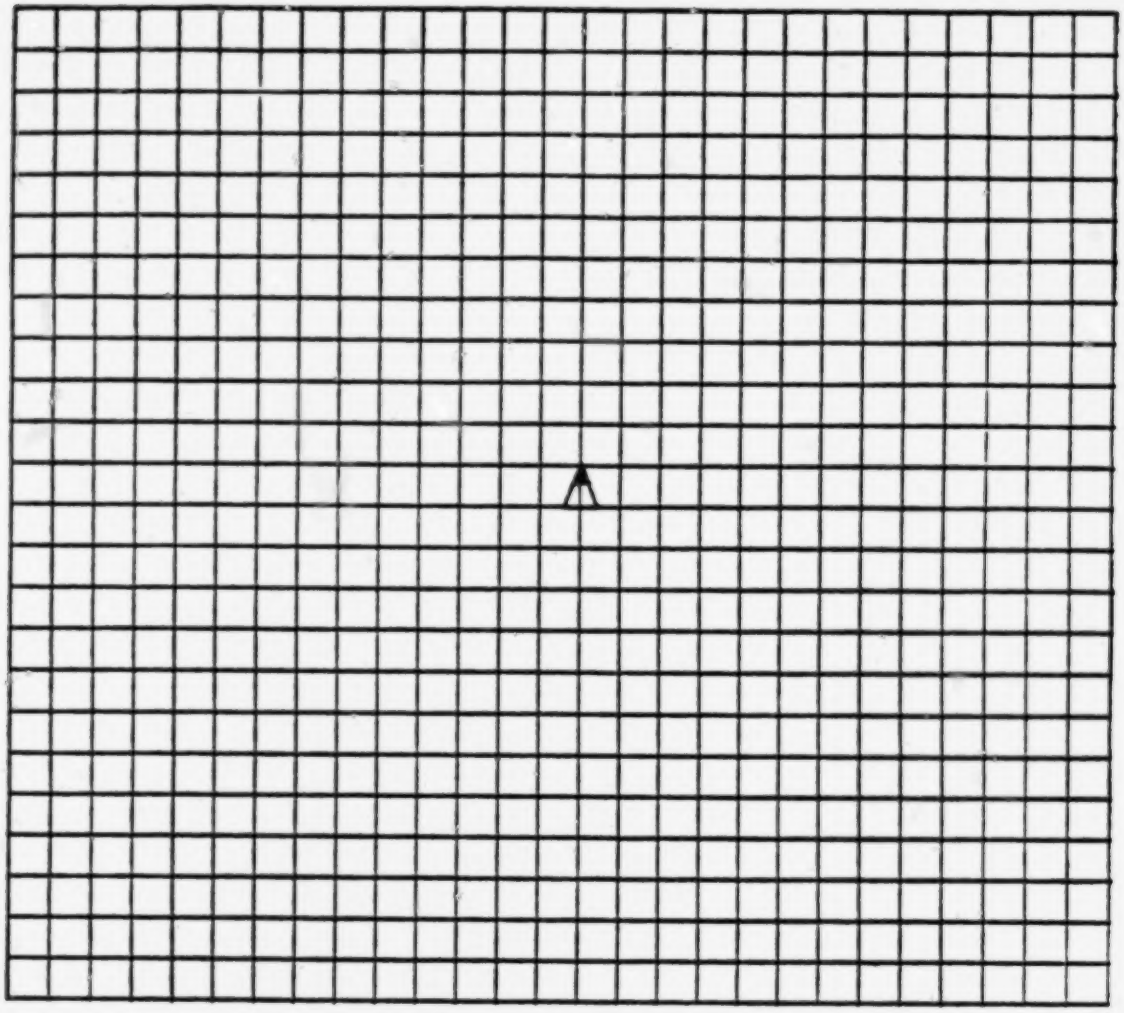
Draw what you think.



Type it. Do you agree with Turtle?

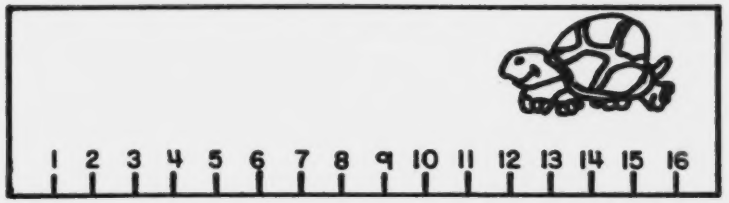
What will Turtle draw?

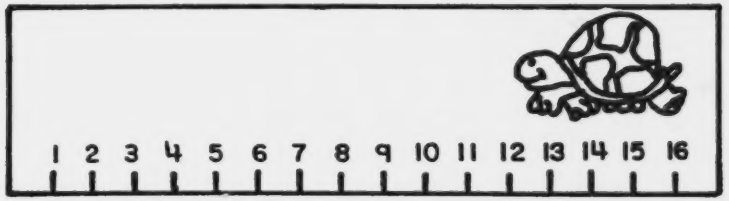
```
U FFFF RRR FF D FF RRR FF RRR FF
RRR FF M U FFFF LLL FF D FF LLL FF
LLL FF LLL FF M RRR O RRR U FFFF
D RRR FFFF R F R F M U BBBB RRR D FFFF
L F L F M
```

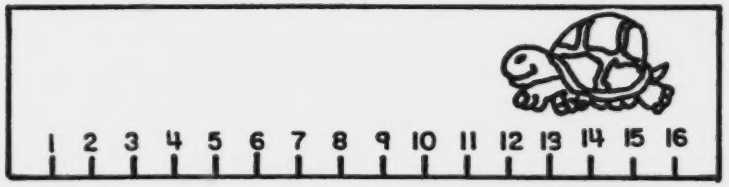


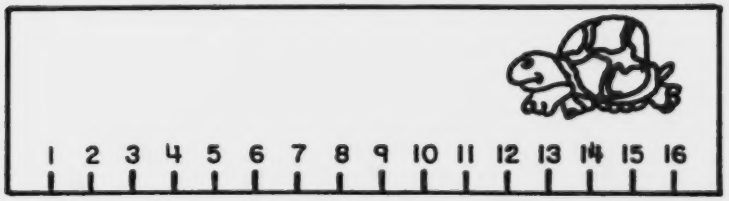
Type it. Do you agree with Turtle?

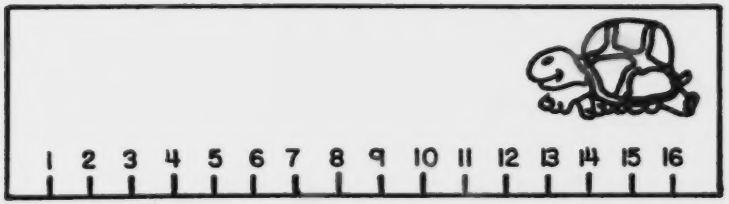
These Turtle Tracks will help measure diagonal lines on the grid.

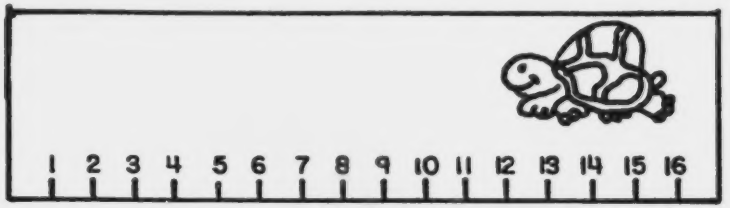


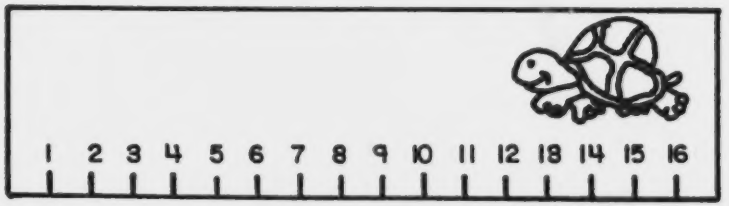


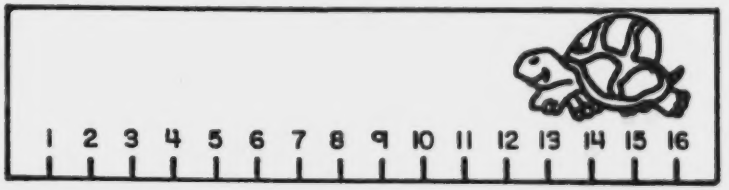


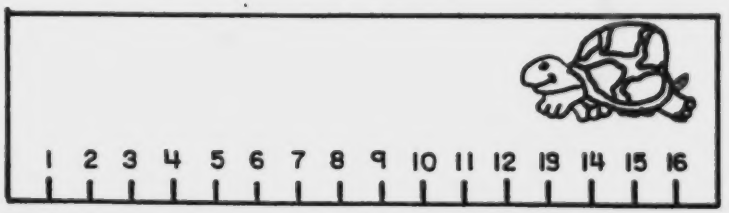


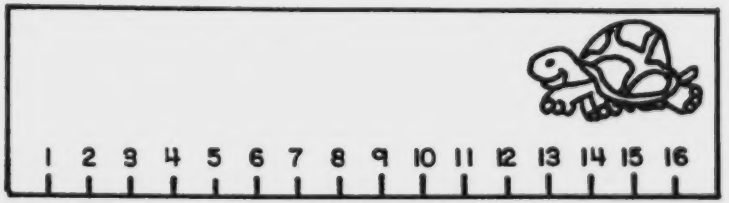












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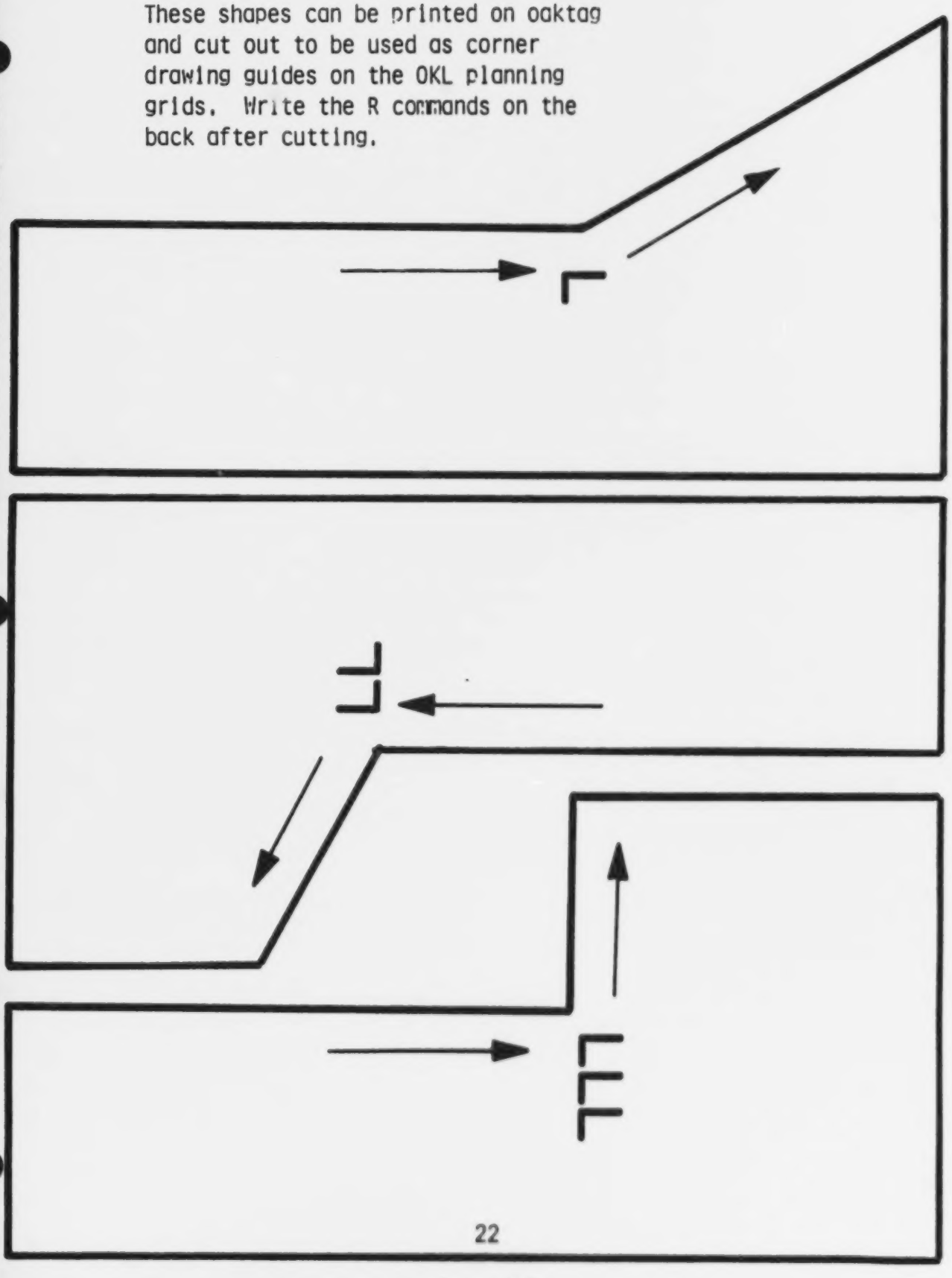
These shapes can be printed on oaktag and cut out to be used as corner drawing guides on the OKL planning grids. Write the R commands on the back after cutting.



TURTLE WALK ACTIVITIES

-- Let one child be the turtle, while others take turns giving directions using "F," "R" and "L." Baby steps would be appropriate since the turtle takes very small steps on the screen. A computer screen or larger T.V. monitor should be positioned to allow children to view the turtle following the same directions as the student in the room. Be sure to use ample walking space. The "R" and "L" movements are likely to be inconsistent and erratic, not matching those on the screen. This is insignificant and will be remedied as the child explores the screen using these same commands.

-- Have four children of the same approximate size make a square with their outstretched arms forming the sides. Ask another child to be the turtle and to describe his/her movements as she/he walks around the square, using "F," "R" and "L." The commands can be entered in the computer while the children view the screen (careful on the angles). Children can also try circles and triangles.

-- Modify the game "Mother/Father May I" to reinforce the initial commands. Children can run their own game in small groups.

-- "Control Tower" is a game where students are paired and stand at opposite sides of the room. One student wears a blindfold while the other is the "control tower." Between the two students are tables and chairs creating a maze or an obstacle course. The purpose is for the control tower to bring the blindfolded student in for a safe landing.

-- Children may work in pairs, trading positions as "turtle" and "programmer." Can be done in the classroom or as a playground activity. Use only "R," "L" and "F."

-- Having your children make their own turtles. Carefully split whole walnuts, having the children clean out the half shells. The children can paint their shell and, if desired, glue each to a cardboard cutout of a turtle. Students can then manipulate their "turtles" on large sheets of paper simulating the movement of the turtle on the screen.

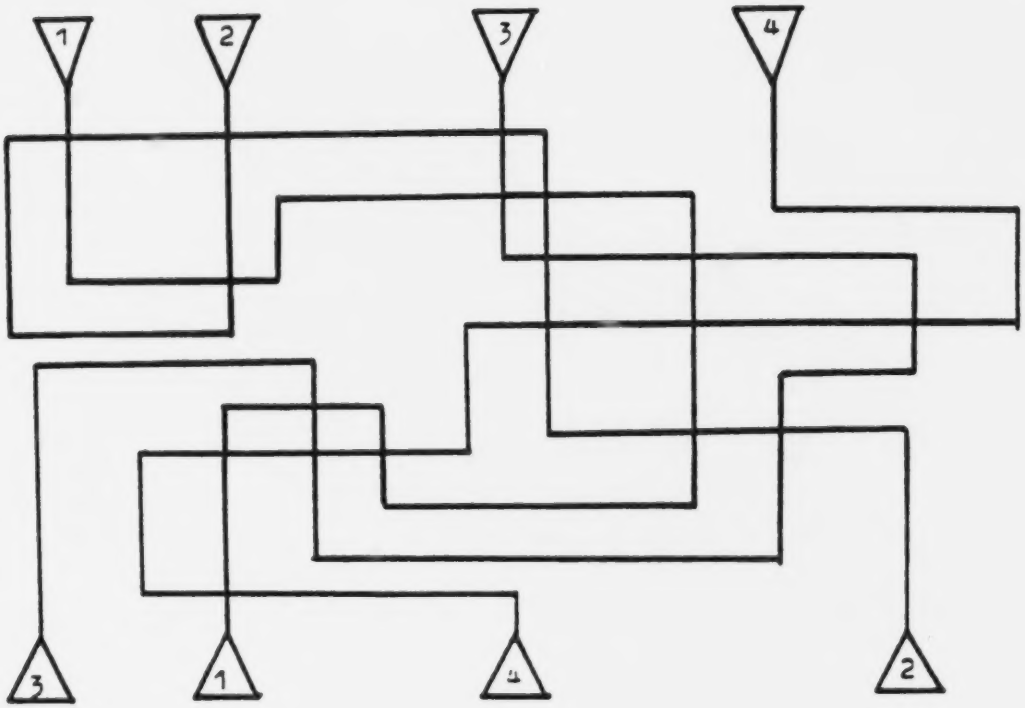
-- Using large sheets of butcher paper, construct a simple street map (could be a neighborhood). Children can label several points on the map (turtle's home, school, turtle food factory, etc.). They are to walk their turtle around the map, recording the steps taken to reach various places. Use "F," "R" and "L."

-- In any turtle walking activity it would be a good idea to have the teacher take the role of the turtle first. The teacher can accurately model the behavior of the turtle. It is important that the turtle only follow directions, not interpret them.

-- "Simon Says" can be used to give students a feel for the turtle's movements. The leader gives the commands to everyone, some preceded by "Simon Says" and others without it. The game can include any number of commands and have any number of consequences for not following "Simon."

"Turtle Scramble" allows students to trace a predetermined path communicating the commands required. Use masking tape to lay out several turning, intersecting paths. As the students go from start to finish, they shout the commands they are performing. Another student may copy these directions. Other students may be given these directions, following them to walk the taped path as a check. Blindfolding one student and having another guide the first would be a variation similar to "Control Tower," maybe even starting several students at once.

TURTLE SCRAMBLE



The geoboard and planning grids are other recommended off-computer activities.

TROUBLE SHOOTING LOGO

1. Insert KRELL'S LOGO disk.
   Turn on computer. Wait for ?
2. Insert Student Utilities disk.
3. Type DRAW [RETURN]

Error Messages

THERE IS NO PROCEDURE NAME . . .

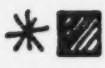
Check for:
1. missing spaces
2. typing error
3. the names of the procedures in memory (POTS).

. . . . NEEDS MORE INPUTS

You must add a number to the command, such as FD 49 or RT 60.

. . . . DIDN'T OUTPUT

You must precede name with " to SAVE or READ on disk.

 [CTRL] Y [RETURN]

or

Start over with steps 1, 2, 3.

Apple][plus

[- [SHIFT] N [SHIFT] M -]

Apple][e

[Use bracket keys]
don't shift

Have [CAPS LOCK] KEY DOWN:

LOGO SHORT WORDS

ST	Show turtle
HT	Hide turtle
FD #	Forward
BK #	Back
RT #	Right
LT #	Left
CS	Clearscreen
PU	Penup
PD	Pendown
HOME	Turtle centered, pointing up
DRAW	HOME + CS + ST
ND	Nodraw -- Text mode
[	Shift - N on Apple II + only
]	Shift - M on Apple II + only

LOGO EDITOR

ESC	Erases previous character
←	Moves cursor left
→	Moves cursor right
CTRL-A	Moves to beginning of line
CTRL-B	Moves back
CTRL-C	Completes edit
CTRL-D	Deletes a character
CTRL-E	Move to end of line
CTRL-F	Moves forward
CTRL-G	Goofed, get out of editor
CTRL-K	Kills all to the right
CTRL-N	Next line; down
CTRL-O	Opens new line
CTRL-P	Previous line; up
RETURN	Inserts a line

SAVE AND READ A PICTURE

You will be able to save a picture which has been drawn on the screen to your diskette. The following steps show you how to save a FLAG which has been drawn on the screen.

```
? ED FLAG

TO FLAG
    FD  110  RT 90  FD 60  RT 90
    FD  40  RT 90  FD 60  HT
END
CTRL-C

?FLAG
    A FLAG will be drawn.
?SAVEPICT "FLAG
    The picture on the screen will be saved to your diskette.

?CATALOG
    All of the programs, procedures, and pictures on the
    diskette will be listed on the screen.  Among those
    listed will be:  FLAG.PICT,
    Pictures will always have .PICT added to the name of
    your picture.

?DRAW
    This command places the turtle in the home position
    and clears the screen.

?READPICT "FLAG
    The picture named FLAG will be read from the diskette
    and placed upon the screen.  If it is not visible, type
    CONTROL-S  (Splitscreen) on CONTROL-F (Fullscreen) to
    get a view of part or all of the graphics screen.
```

SAVE AND READ A PROCEDURE

You will be able to save a procedure which has been written in the editor. The following steps will show you how to save a FLAG procedure.

```
ED  FLAG

TO FLAG
    FD  110  RT  90  FD  60  RT  90
    FD   40  RT  90  FD  60  RT  90
    BK   70  HT

END

CTRL-C
```

```
?FLAG
```
A FLAG will be drawn.

```
?SAVE "FLAG
```
The procedure to draw a FLAG will be saved to your diskette.

Now, any time you want the FLAG procedure back in memory you can read it back from your disk.

```
?CATALOG
```
All of the programs, procedures, and pictures on the diskette will be listed on the screen. (You may need to type CTRL-T to see the whole list.)
On the list will be FLAG.LOGO.
LOGO procedures will always have .LOGO added to the file name.

```
?DRAW
```
This command places the turtle in the home position and clears the screen.

```
?READ "FLAG
```
FLAG will be read into the computer's memory.

```
?FLAG
```
The turtle will draw the FLAG on the screen.

LOGO

PRINTING A PICTURE

Any picture produced on the screen can be printed on paper if a printer is attached to the computer with a graphics interface card. The Decwriter printer will not print the graphics screen. The smaller dot matrix printers should be able to print graphics screens.

Follow these directions.

1. Type READ "PRINTER [RETURN] This is a procedure on your Nebraska Department of Education Student Utility Diskette.

2. Place a picture on your screen.

3. Turn on the printer. Have paper in position in the printer and the "SEL" light on.

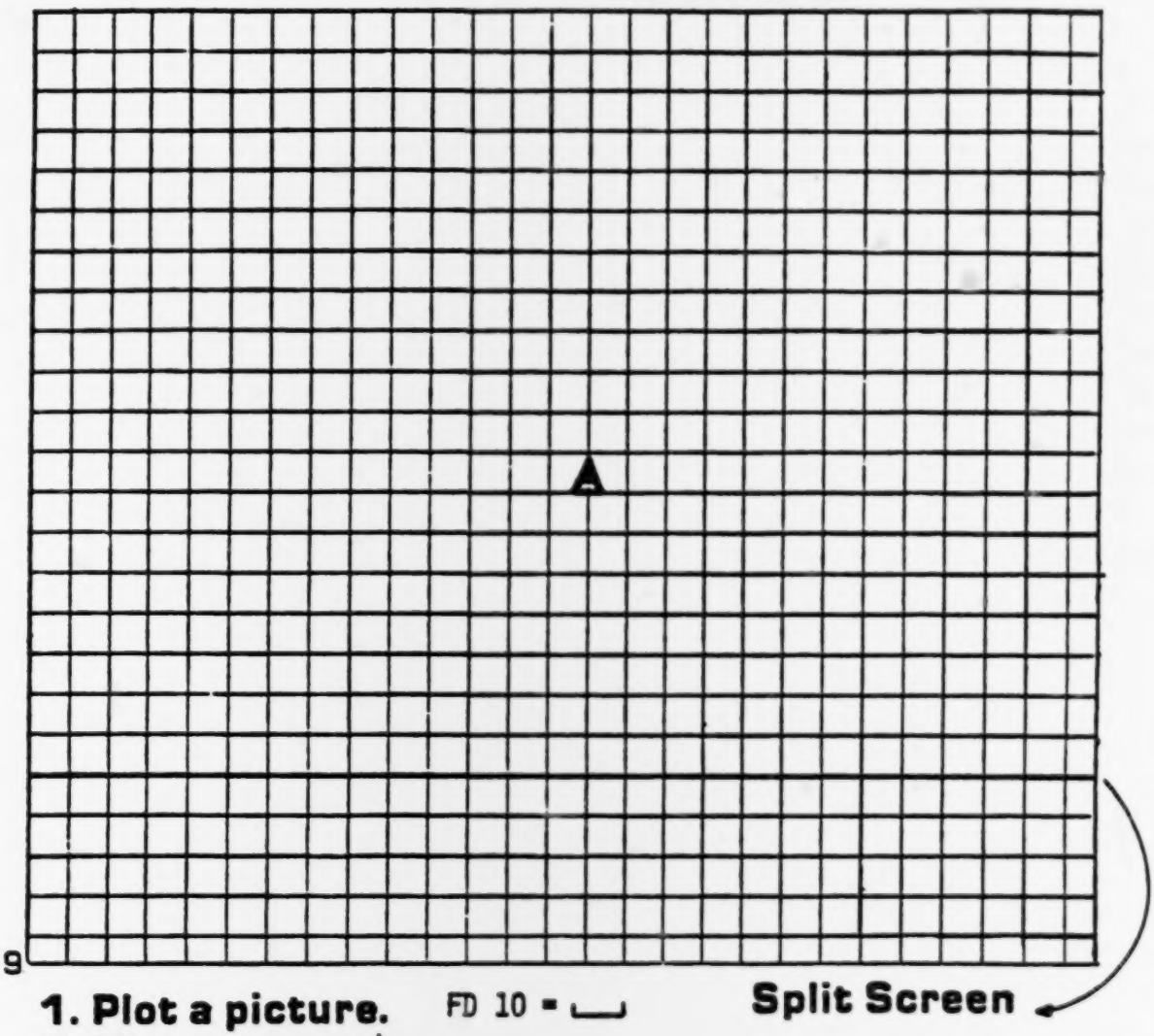
4. Type PRINTER [RETURN] Answer each question and press [RETURN] The picture will be reproduced on paper by the printer.

5. Wait to advance paper until printer stops.

6. If you want another copy of the same picture, adjust the paper in the printer, put "SEL" light back on, and type PRINTER [RETURN].

   Or . . . Another picture can now be put on the screen, paper adjusted, the "SEL" light back on, and you're ready for the next printout.

LOGO



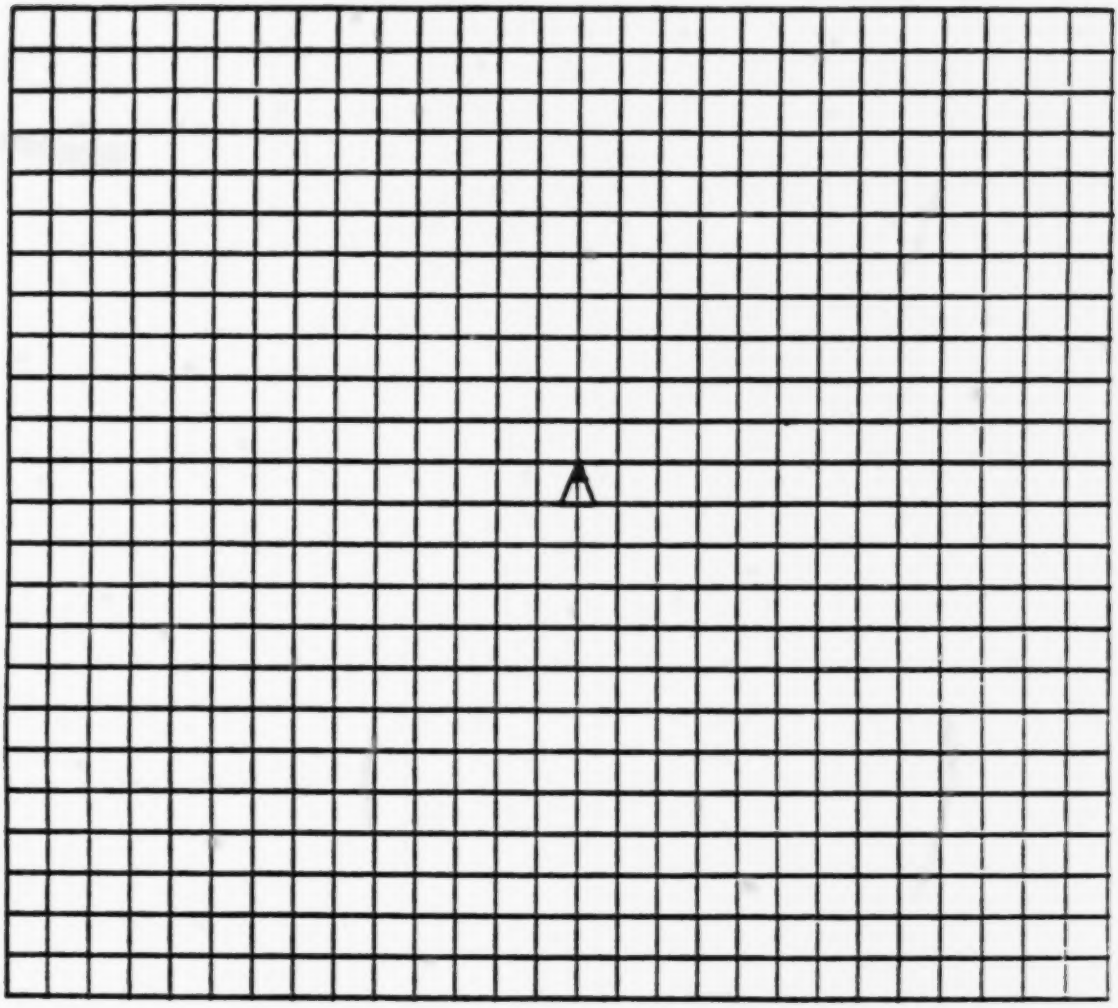
1. Plot a picture. FD 10 = ⌴ **Split Screen**
2. Plan a program.

---

3. Type it.
4. Bugs out.

What will Turtle draw?

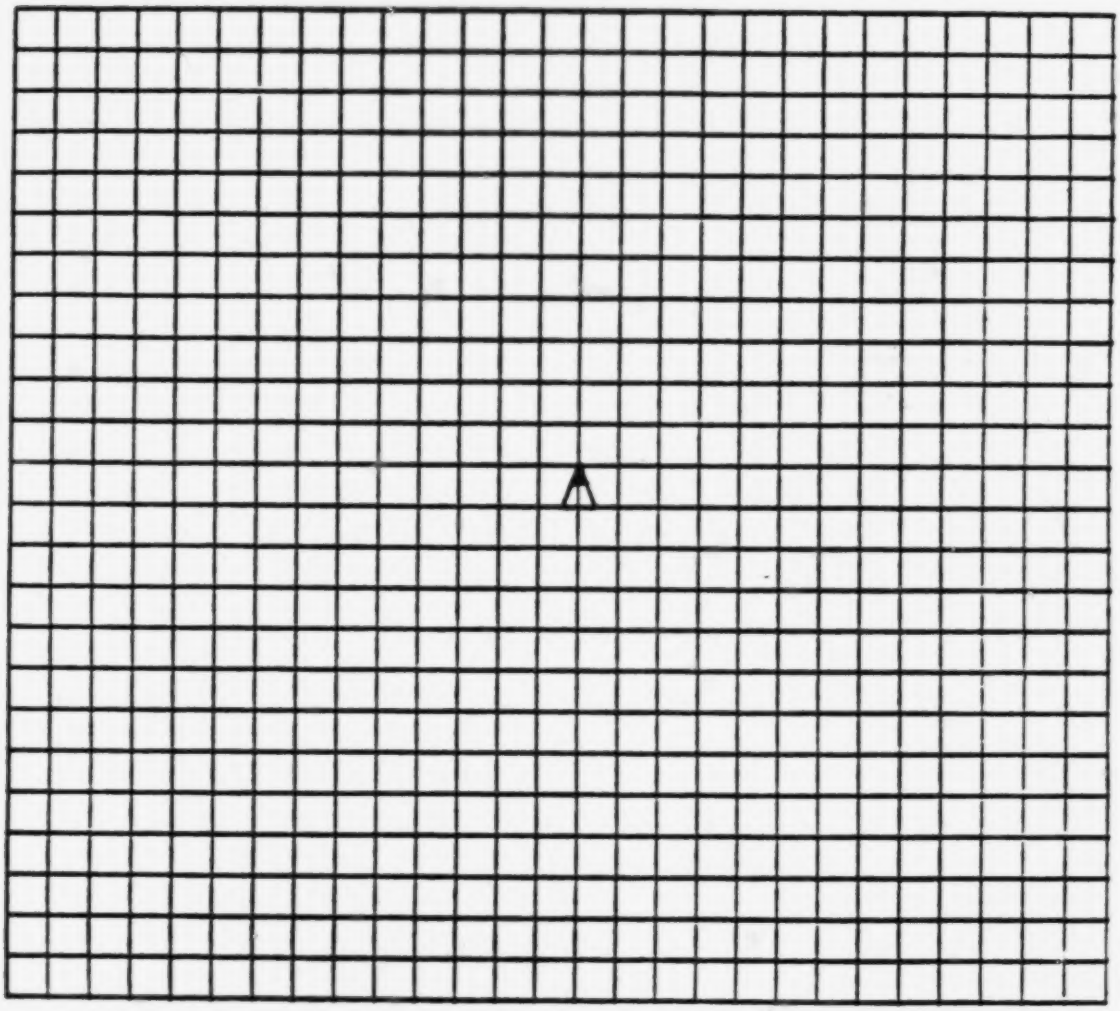
FD 50	RT 90	FD 100	HT
RT 90	FD 100	BK 50	
FD 100	RT 90	RT 90	
RT 90	FD 50	FD 50	
FD 100	RT 90	BK 100	



Type it. Do you agree with Turtle?

What will Turtle draw?

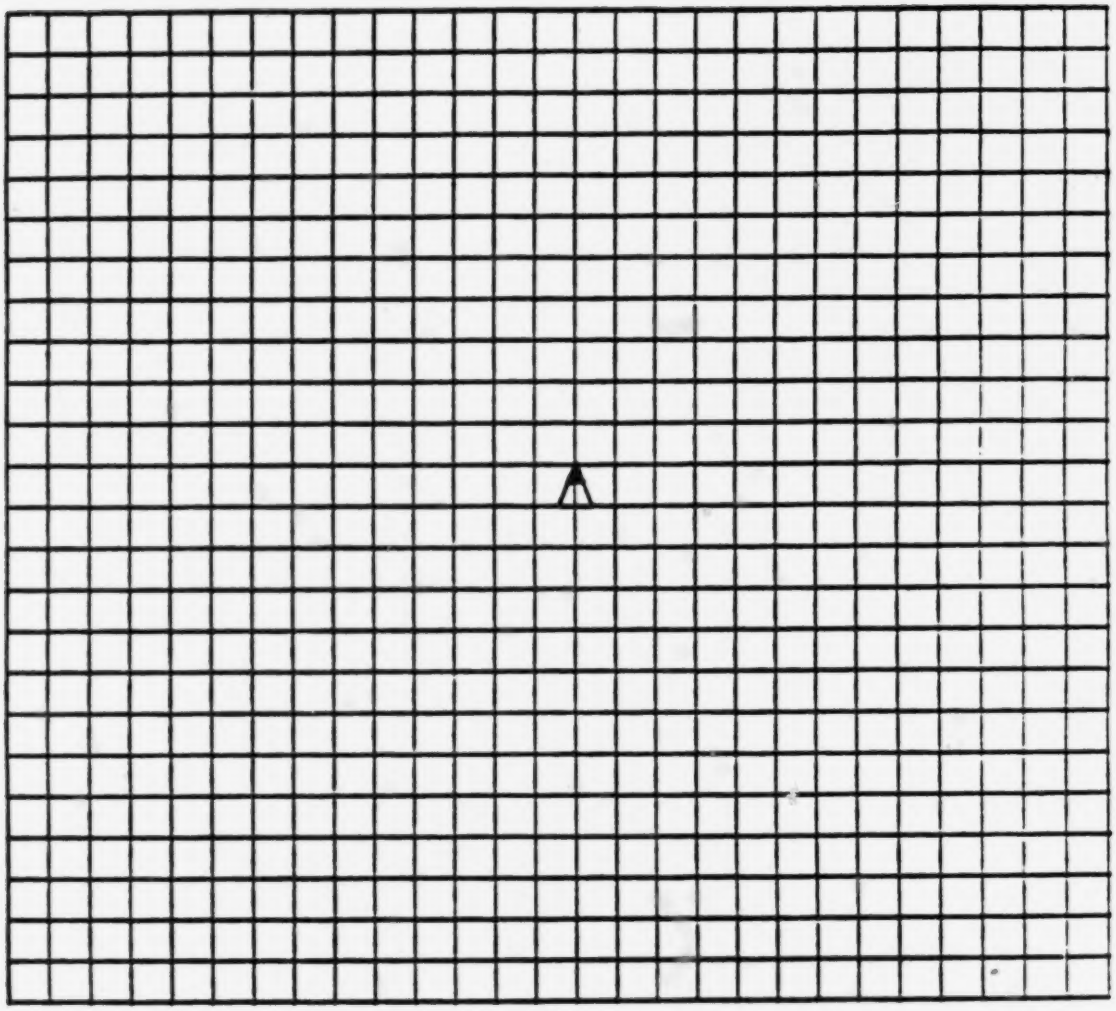
PU	FD 25	FD 35	FD 45	FD 105
BK 50	RT 90	RT 90	RT 90	RT 120
PD	FD 25	FD 35	FD 45	FD 105
FD 105	RT 90	RT 90	RT 90	HT
RT 90	LT 180	FD 35	FD 45	
		LT 180	RT 30	



Type it.

What will Turtle draw?

```
Repeat 4[FD 60 RT 90]
Repeat 4[FD 60 LT 90]
RT 90 BK 5
Repeat 20[FD 10 RT 18]
HT
```



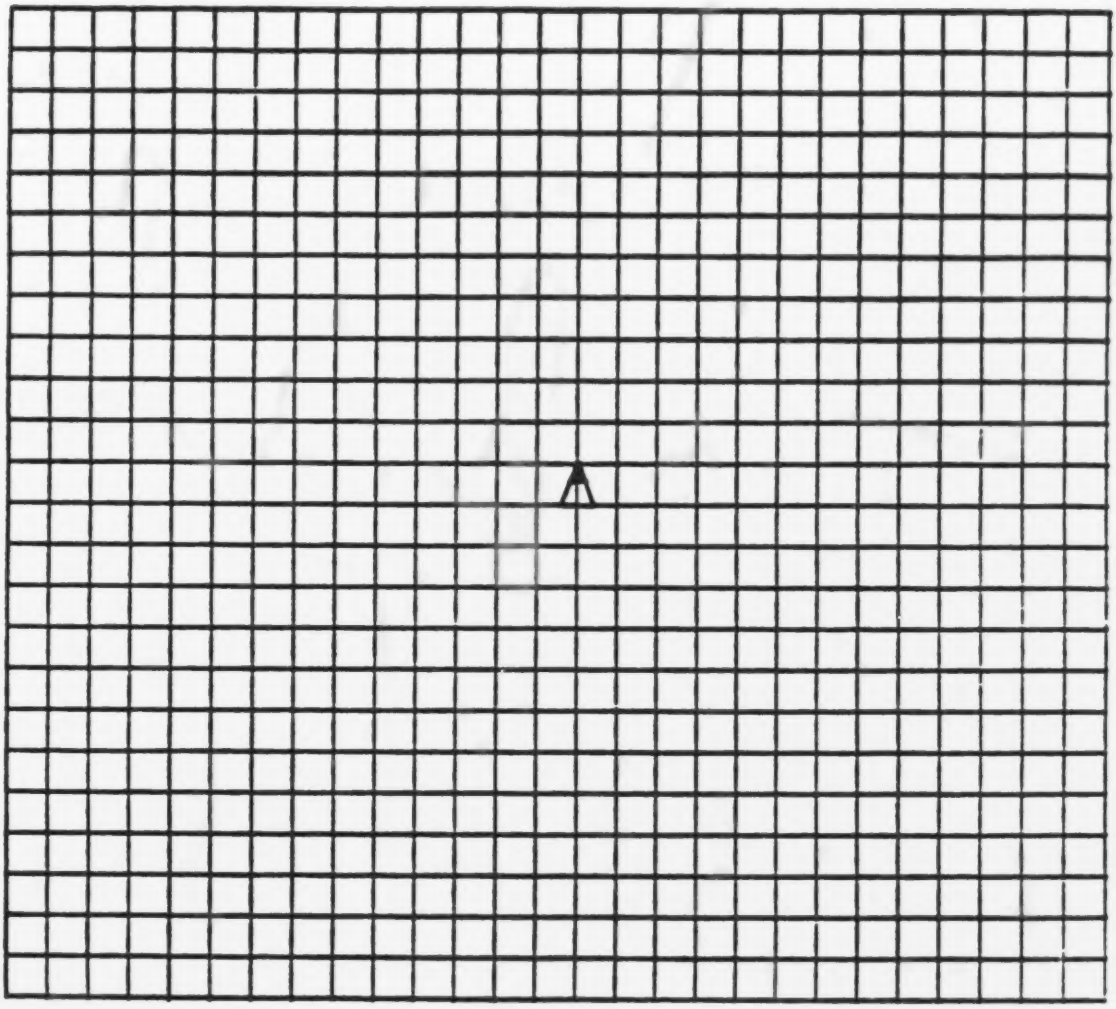
Type it. Do you agree with Turtle?

What will Turtle draw?

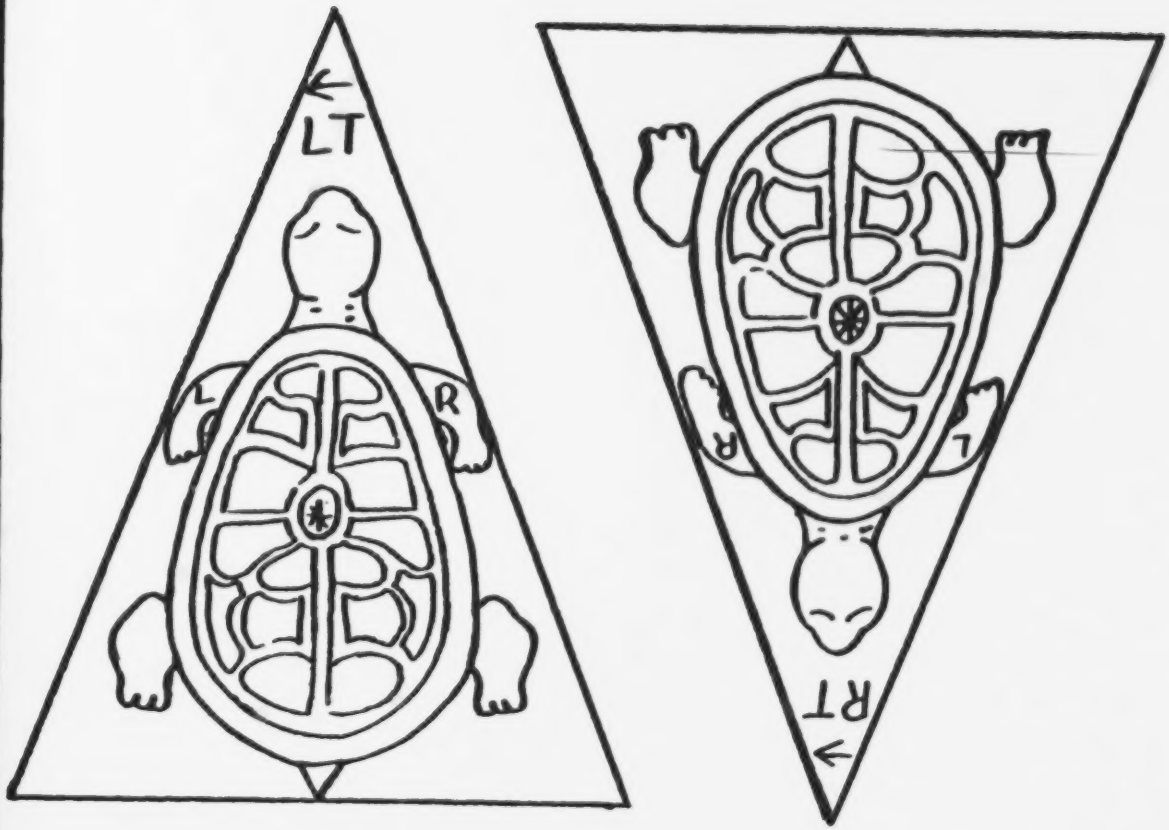
```
To REC
   Repeat 2 [FD 100 RT 90 FD 20 RT 90]
   END

To REC4
   Repeat 4[REC RT 90]
   END

REC4
```



Type it. Do you agree with Turtle?

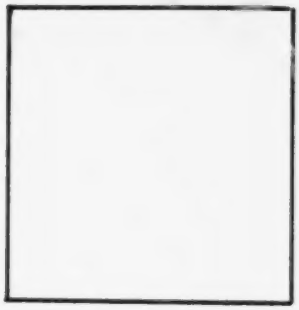

LT
R
L
R
RT

0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
right
right

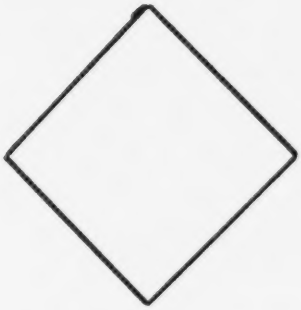
0
15
30
45
60
75
90
105
120
135
150
175
180
195
210
225
240
255
270
285
300
315
330
345
left
left

REPEAT COMMAND SHAPES

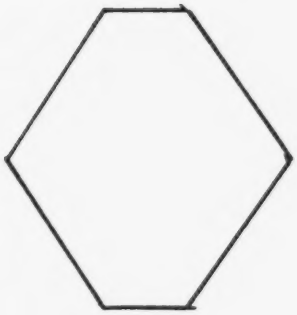
Find and record the number of times to repeat and the number of degrees to turn the Turtle to draw each shape and return the Turtle to the start.



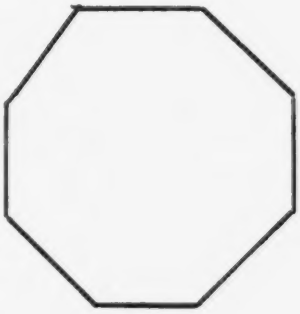
Repeat_____
Forward 50 right_____



Repeat_____
Forward 50 right_____



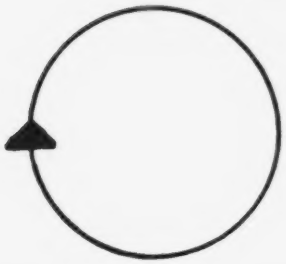
Repeat_____
Forward 50 right_____



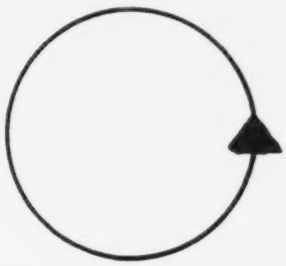
Repeat_____
Forward 50 right_____

REPEAT COMMAND CIRCLES

Find and record the number of times to repeat and the number of degrees to turn the Turtle to draw each circle or arc.



Repeat_____
Forward 1_____ _____



Repeat_____
Forward 1_____ _____

Repeat_____
Forward 1_____ _____

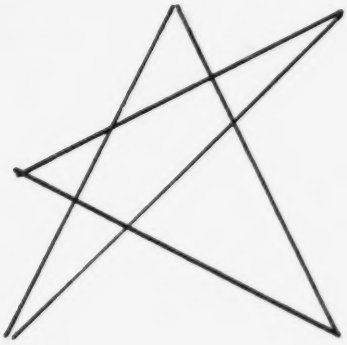
Repeat_____
Forward 1_____ _____

Repeat_____
Forward 1_____ _____

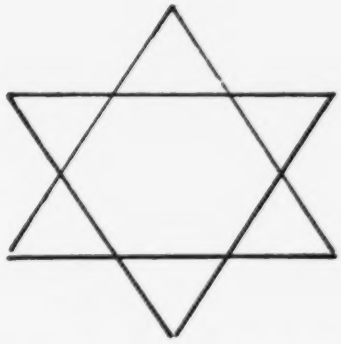
Repeat_____
Forward 1_____ _____

REPEAT COMMAND STAR

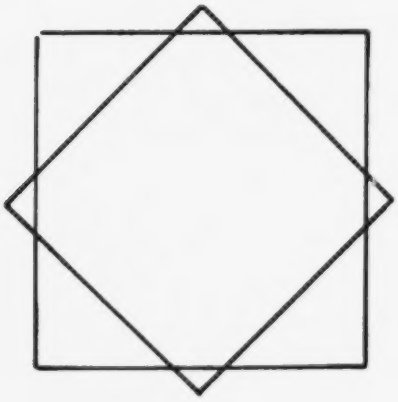
Find and record the number of times to repeat and the number of degrees to turn the Turtle to draw each star and return the Turtle to the start.



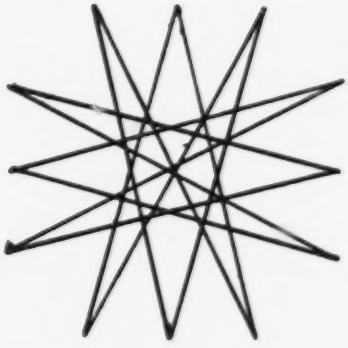
Repeat_____
Forward_____



Repeat_____
Forward_____



Repeat_____
Forward_____



Repeat_____
Forward_____

LOGO HEADINGS AND COORDINATES

HEADING	Outputs the turtle's heading. Range is Ø-36Ø.
SETHEADING #	Points the turtle in a given direction.
SETX #	Moves the turtle horizontally to a given coordinate.
SETY#	Moves the turtle vertically to a given coordinate.
SETXY # #	Moves the turtle to a given point.
TOWARDS # #	Outputs the heading from the turtle to a given point.
XCOR	Outputs the turtle's x-coordinate.
YCOR	Outputs the turtle's y-coordinate.

1.	SETH 9Ø	Points the Turtle to the right.
2.	SETH 18Ø	Points the Turtle down.
3.	SETX 3Ø	Moves horizontally to X = 3Ø
4.	SETX (-12Ø)	Moves horizontally to X = -12Ø
5.	SETY 6Ø	Moves vertically to Y = 6Ø
6.	SETY (-7Ø)	Moves vertically to Y = -7Ø
7.	SETXY 4Ø 6Ø	Moves to point X 4Ø, Y = 6Ø
8.	SETXY Ø (-2Ø)	Moves to point X = Ø, Y = -2Ø
9.	SETH TOWARDS 1Ø 2Ø	Points the Turtle towards the point X = 1Ø, Y = 2Ø.
10.	SETH TOWARDS Ø Ø	Points the Turtle towards the point X = Ø, Y = Ø
11.	SETXY 2Ø 3Ø	
	PR XCOR	Outputs the Turtle's X-coordinate (2Ø)
	PR YCOR	Outputs the Turtle's Y-coordinate (3Ø)

LOGO COLOR

CONTROL

Number	Color
Ø	Black
1	White
2	Green
3	Violet
4	Orange
5	Blue
6	Reverse

COMMANDS

BG #	Background Color
PC #	Pen Color

LOGO NUMERIC OPERATIONS

+	Addition
-	Subtraction
*	Multiplication
/	Division
=	Equals
>	Greater than
<	Less than
QUOTIENT # #	Outputs the integer quotient of: (1st no./2nd no.)
REMAINDER # #	Outputs the remainder of: (1st no./2nd no.)
ROUND #	Rounds to the nearest integer
SQRT #	Finds square root
RANDOM #	Outputs a random number
RANDOMIZE	Randomizes the seed for RANDOM
SIN #	Outputs the sine
INTEGER #	Outputs the integer part

LOGO

FILING AND MANAGING WORKSPACE

	WORKSPACE COMMANDS	EXAMPLE WITH INPUTS
1.	ERASE (ER)	ER SQUARE
2.	PRINTOUT TITLES (POTS)	POTS
3.	PRINTOUT (PO)	PO FLAGS, PO ALL
	DISKETTE COMMANDS	
4.	CATALOG	
5.	SAVE	SAVE "FLAGS
6.	READ	READ "FLAGS
7.	ERASEFILE	ERASEFILE "FLAGS
8.	SAVEPICT	SAVEPICT "FLOWER
9.	READPICT	READPICT "FLOWER
10.	ERASEPICT	ERASEPICT "FLOWER
11.	DOS	DOS [LOCK BOXES.LOGO]

LOGO

RENAME A PICTURE

A. When in LOGO

? DOS ⊏RENAME FLAG.PICT, A1.PICT⊐

The picture FLAG was stored on the diskette as FLAG.PICT

The picture is now saved on the diskette as A1.PICT

B. When in Applesoft BASIC

⊐ RENAME FLAG.PICT, A1.PICT

The picture FLAG was stored on the diskette as FLAG.PICT

The picture is now saved on the diskette as A1.PICT

DEMONSTRATIONS OF CLASS PROCEDURES

You can exhibit procedures that your class has saved to a disk in a continuous program by following these steps:

```
?READ   "WAIT              This program is on your utilities disk.

?READ   "(each of the individual procedures)

"ED  EXHIBITA
     TO EXHIBITA
     FULLSCREEN
     DRAW GEORGE  WAIT 60   Use names of your class' procedures.
     DRAW MARTHA  WAIT 60
     DRAW HENRY   WAIT 60
           etc. - to include all procedures
     EXHIBITA
     END
    CTRL-C
```

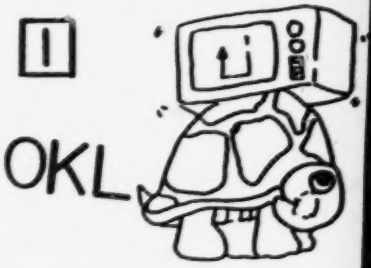
?EXHIBITA — By executing the procedure EXHIBITA, the show should begin and cycle continuously. CTRL-G will stop the procedure.

If the program is correct then:

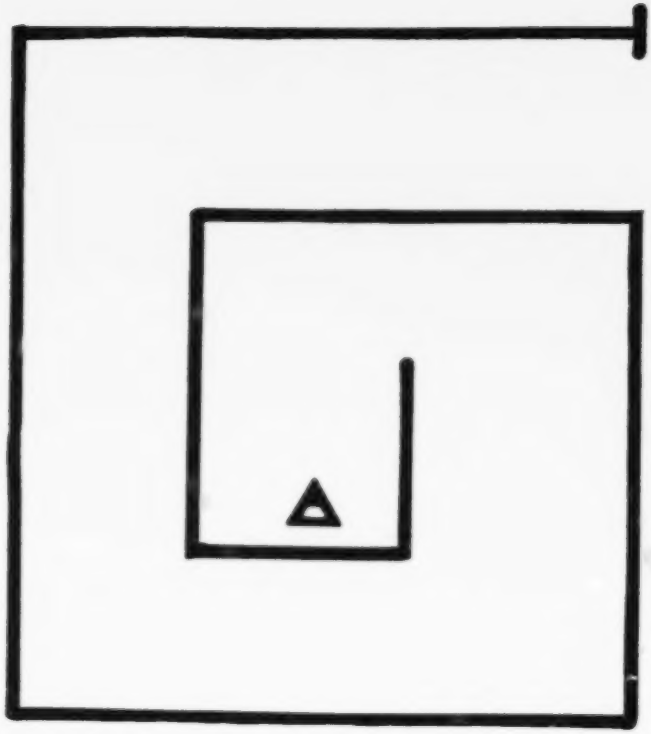
?SAVE "EXHIBITA — It will be saved to your disk ready to use for any presentation, such as an open house. Not only is EXHIBITA saved, but also all procedures read earlier will be saved.

Background color (BG) and pen color (PC) can be changed after any DRAW command.

Caution: Each student's procedure must have a different filename and different subprocedure names. If George made a HOUSE using SQ and Martha made a WINDOW also using SQ, only one SQ would be used by the EXHIBITA program. A possible solution would be for each student to initial their own procedures as they edit them, i.e., George Brown's - SQGB
Martha Smith's - SQMS



FR

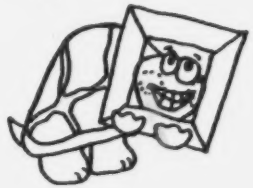


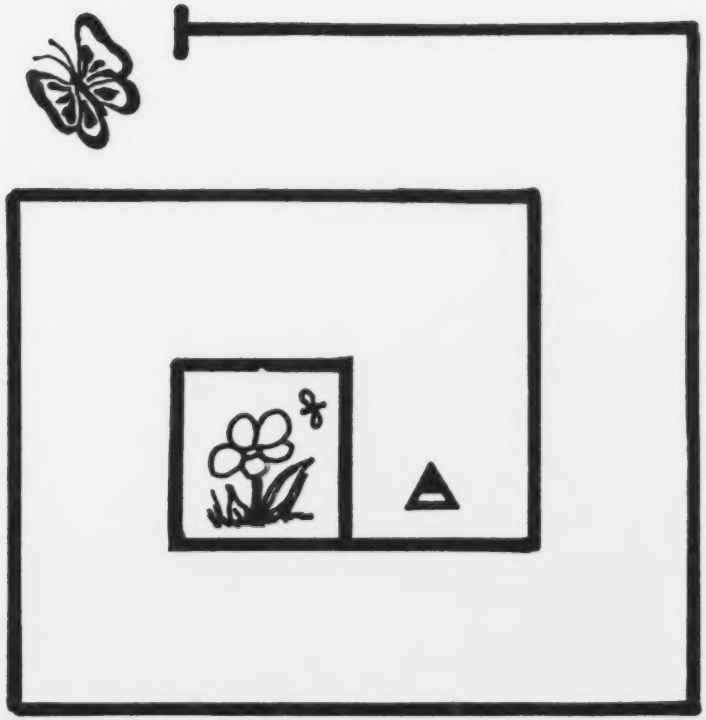
Help Turtle get out of here.

FL

One Key Logo

2

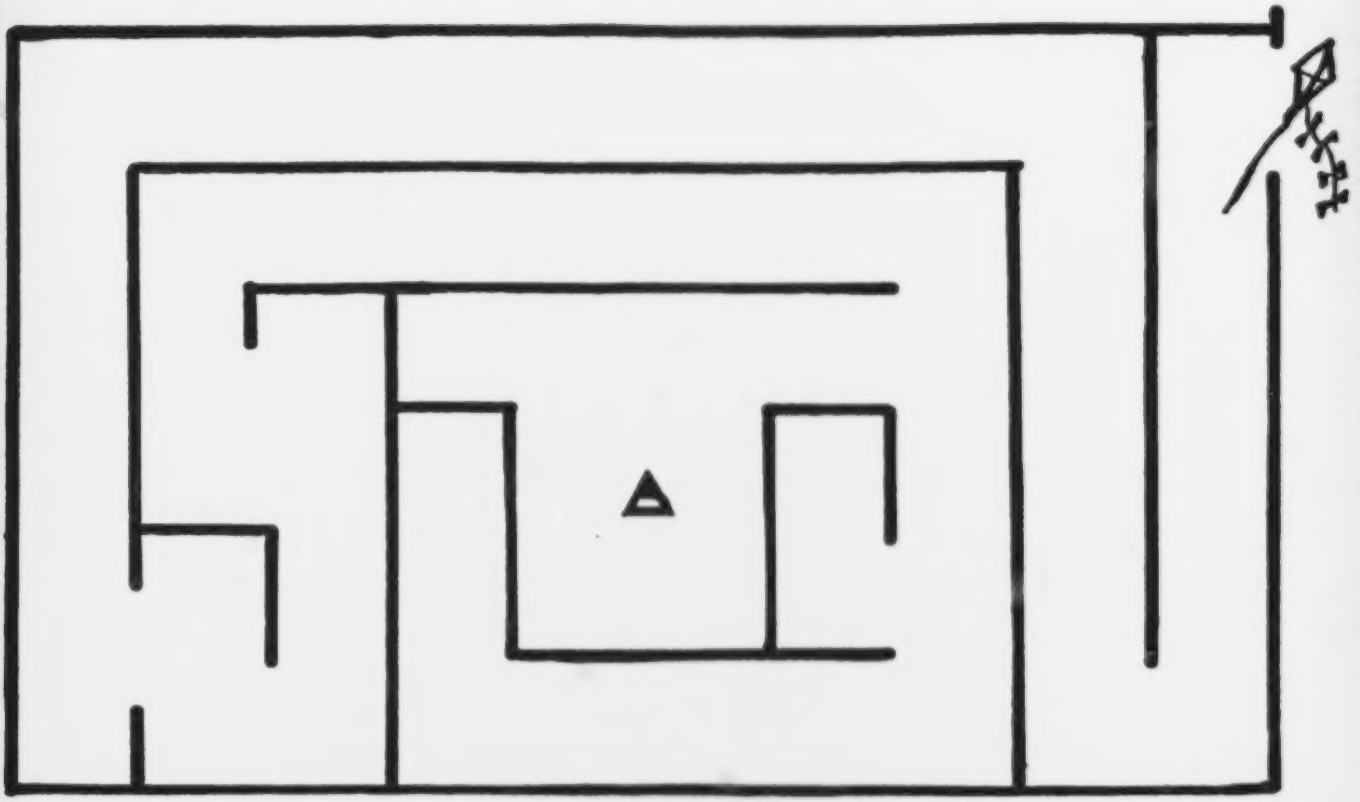




Turtle will go play.

FRL

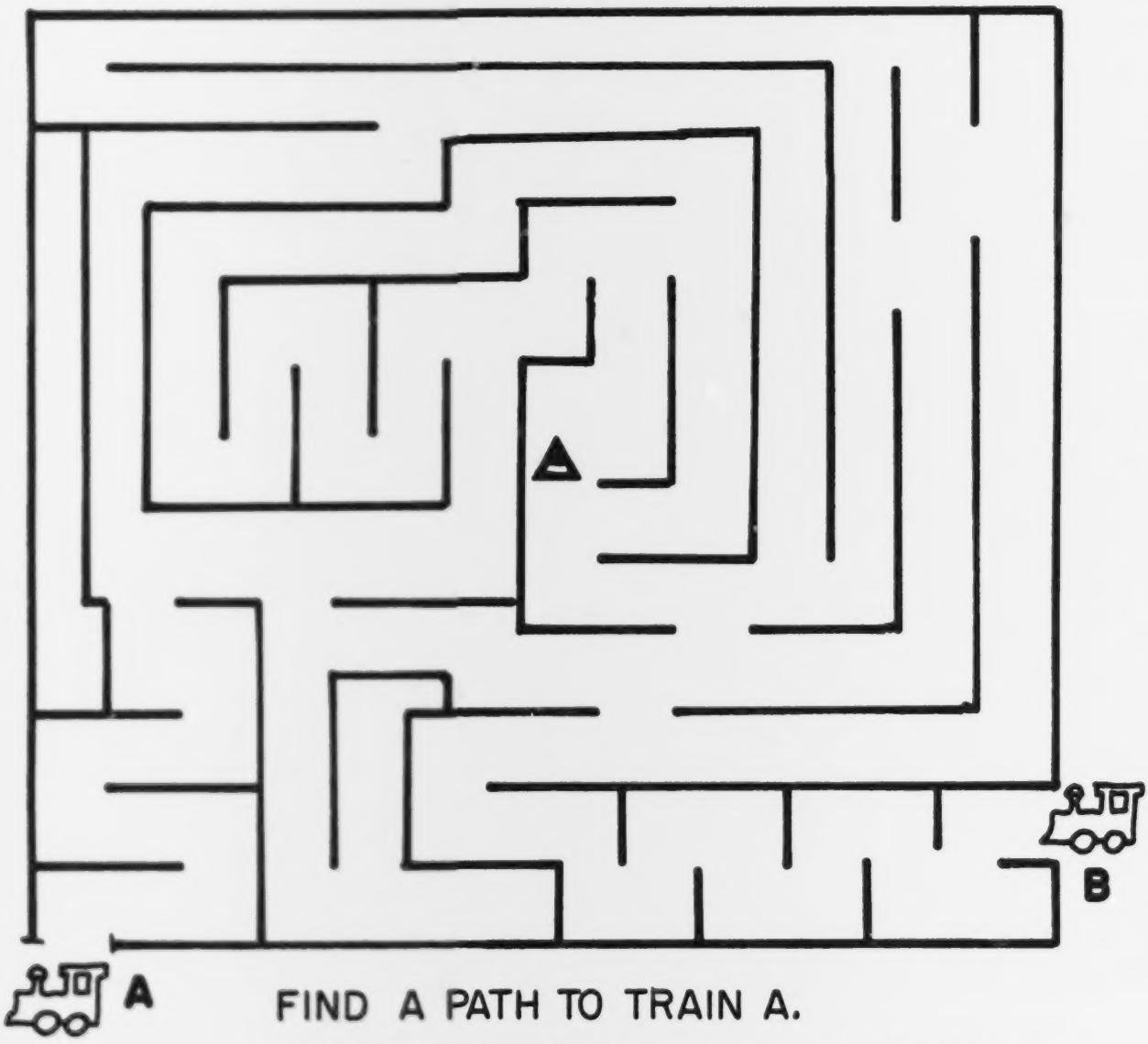
OKL
3



Go fly a kite!

FRLBM

5



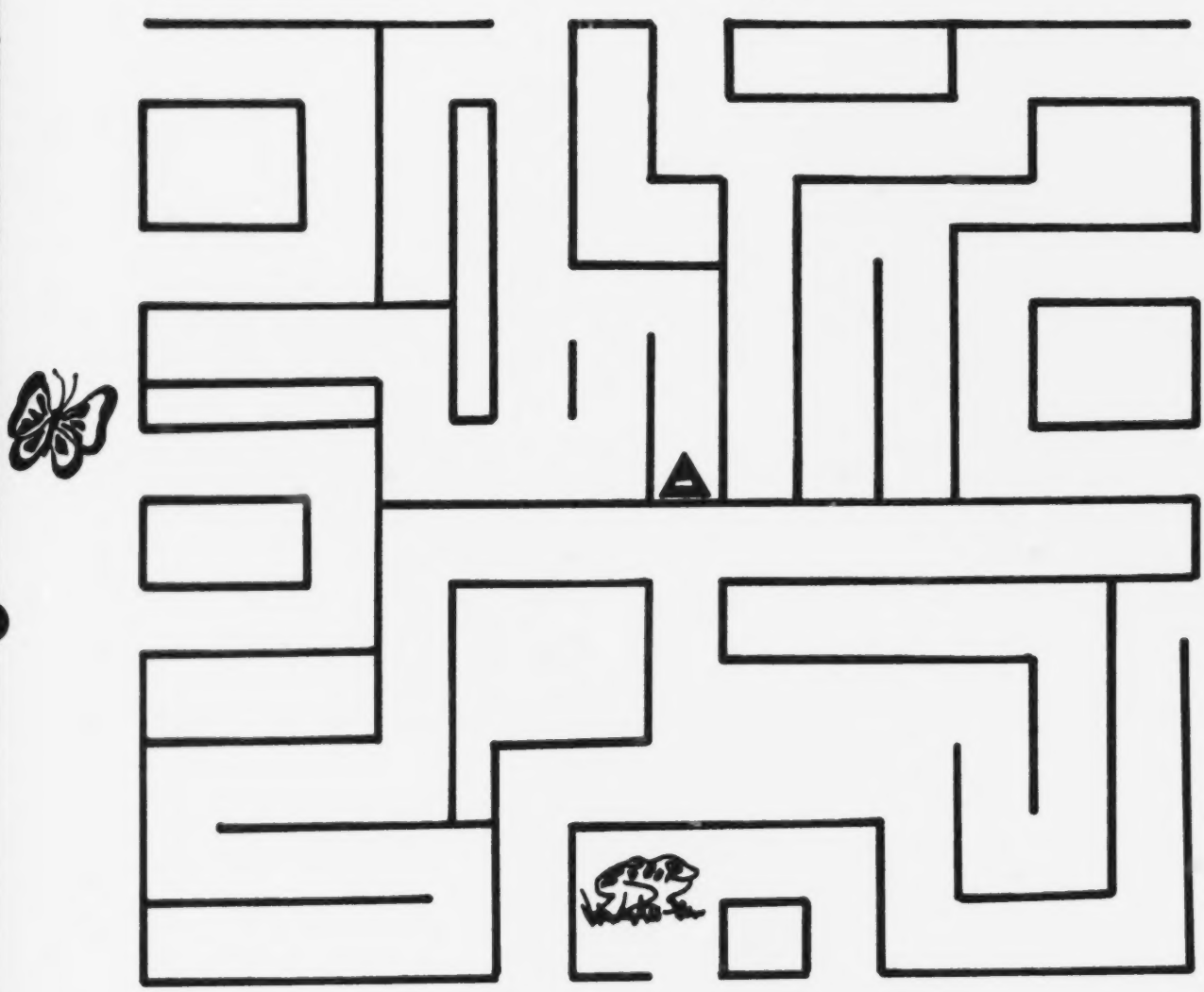
FIND A PATH TO TRAIN A.

USE M TO MOVE TURTLE BACK TO THE MIDDLE.

FIND A PATH TO TRAIN B.

FRL

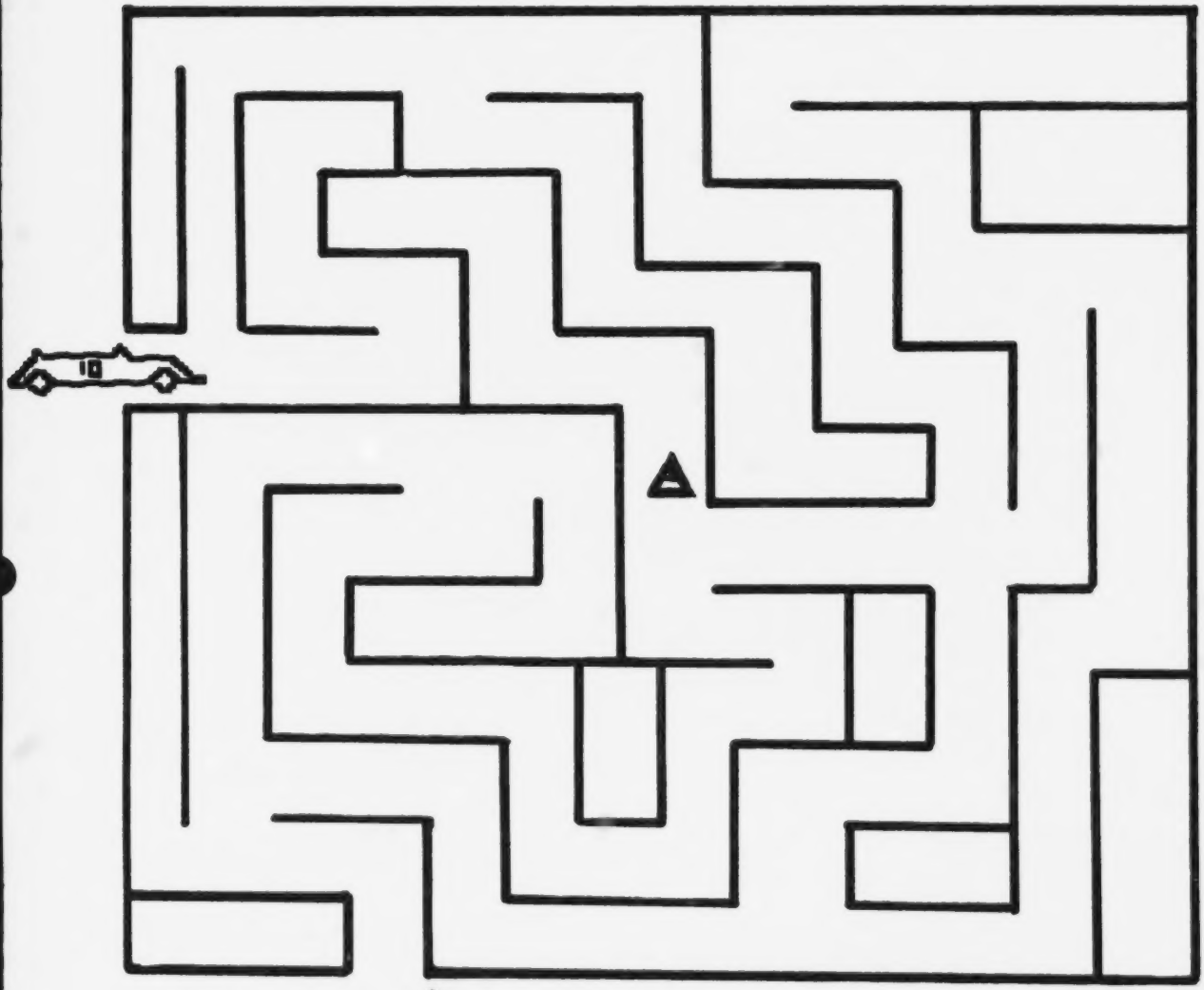
6



Turtle will go out one door and in another looking for his friend the frog.

FRLBUD

4

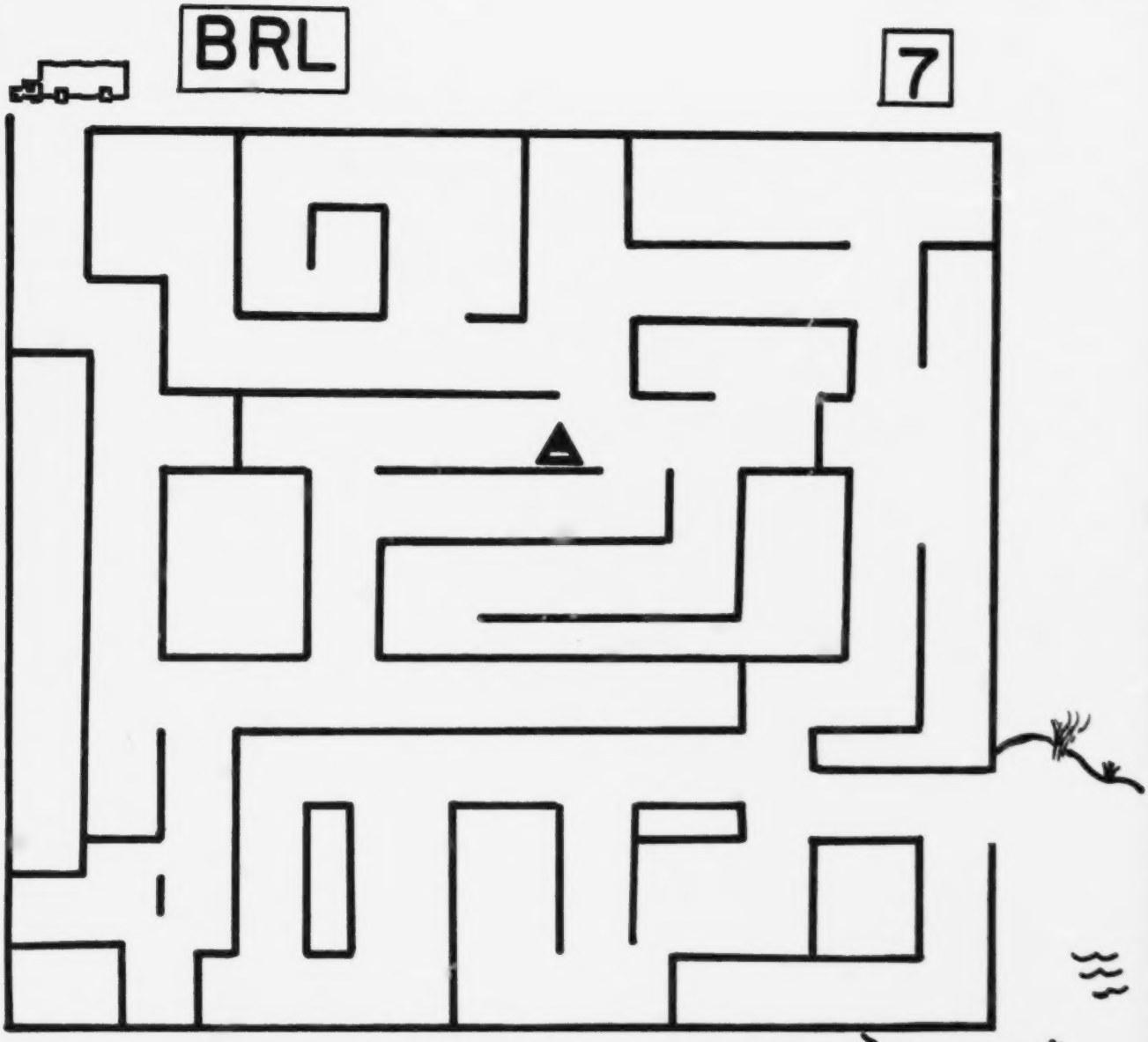


THE WINNER!

PUT TURTLE IN THE CAR WITHOUT MAKING A TRAIL.

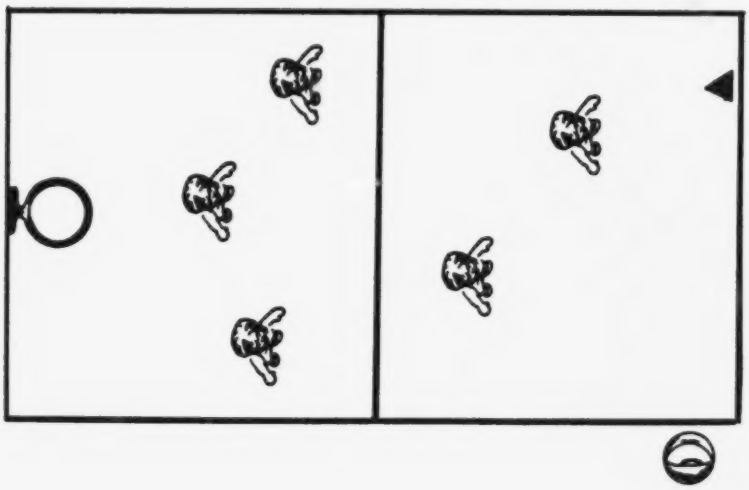
U AND D WILL HELP.

NOW LET'S RACE!



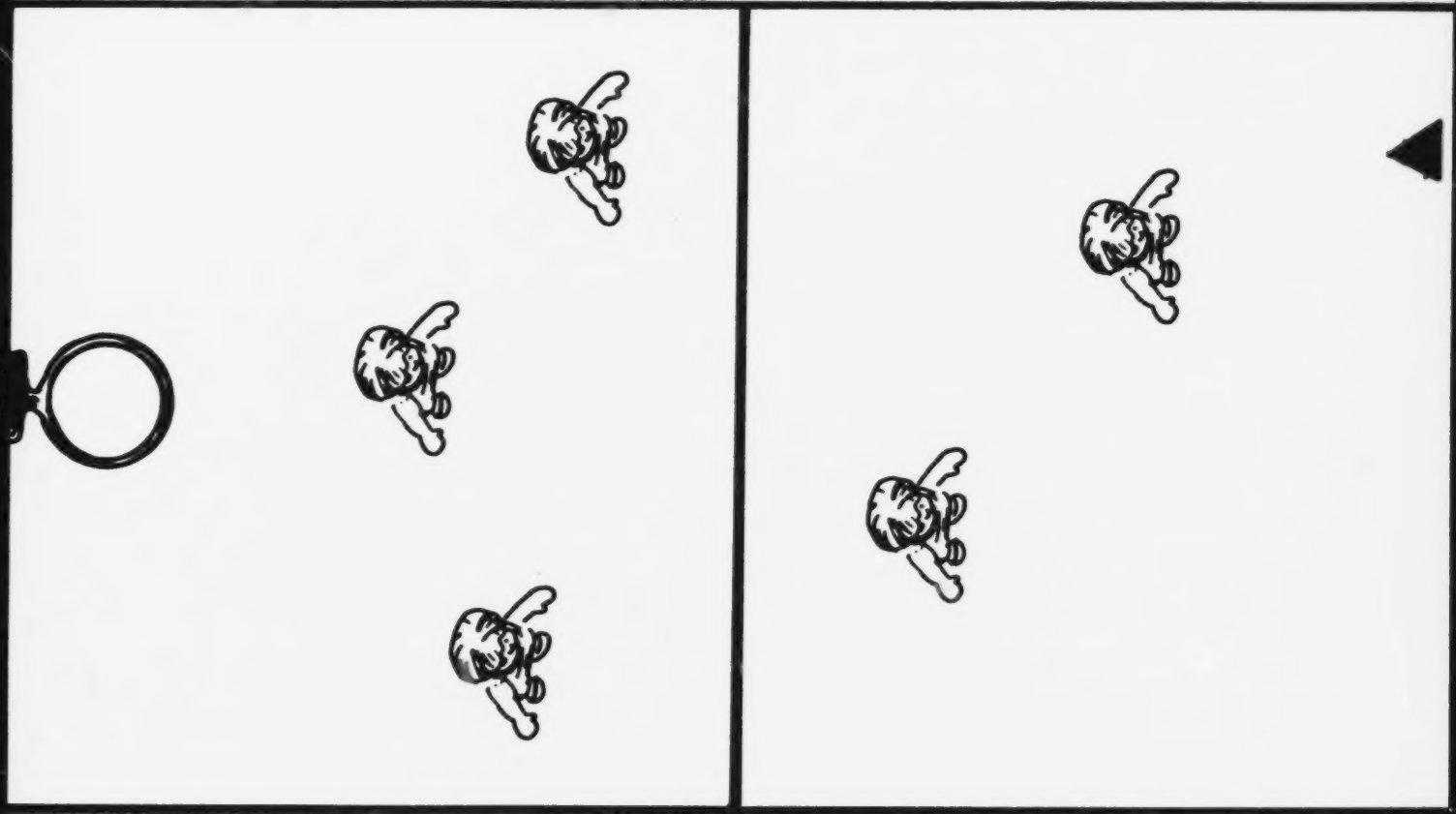
Use U and D to the moving van. Turtle's move to the pond is tricky. Use only B, R and L.

TURTLE BASKETBALL

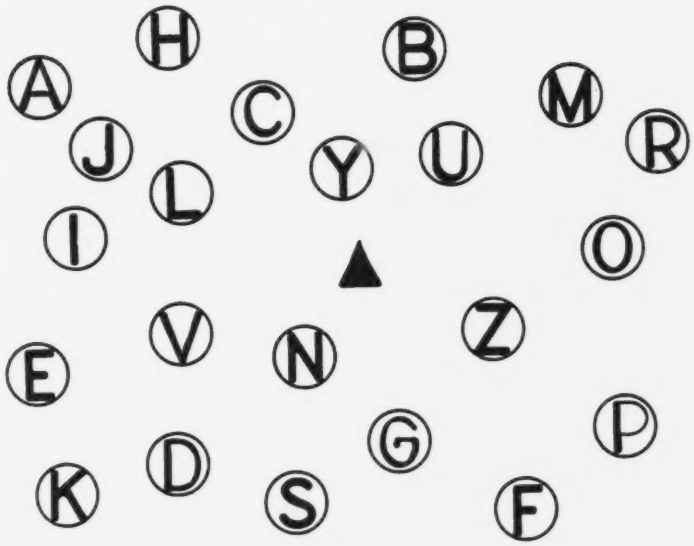


1. Tape transparency to screen.
2. Move Turtle to starting position.
3. Score a basket in the least number of moves possible without being stopped by a defensive player. Keep a record of your "moves."

Turtle Basketball

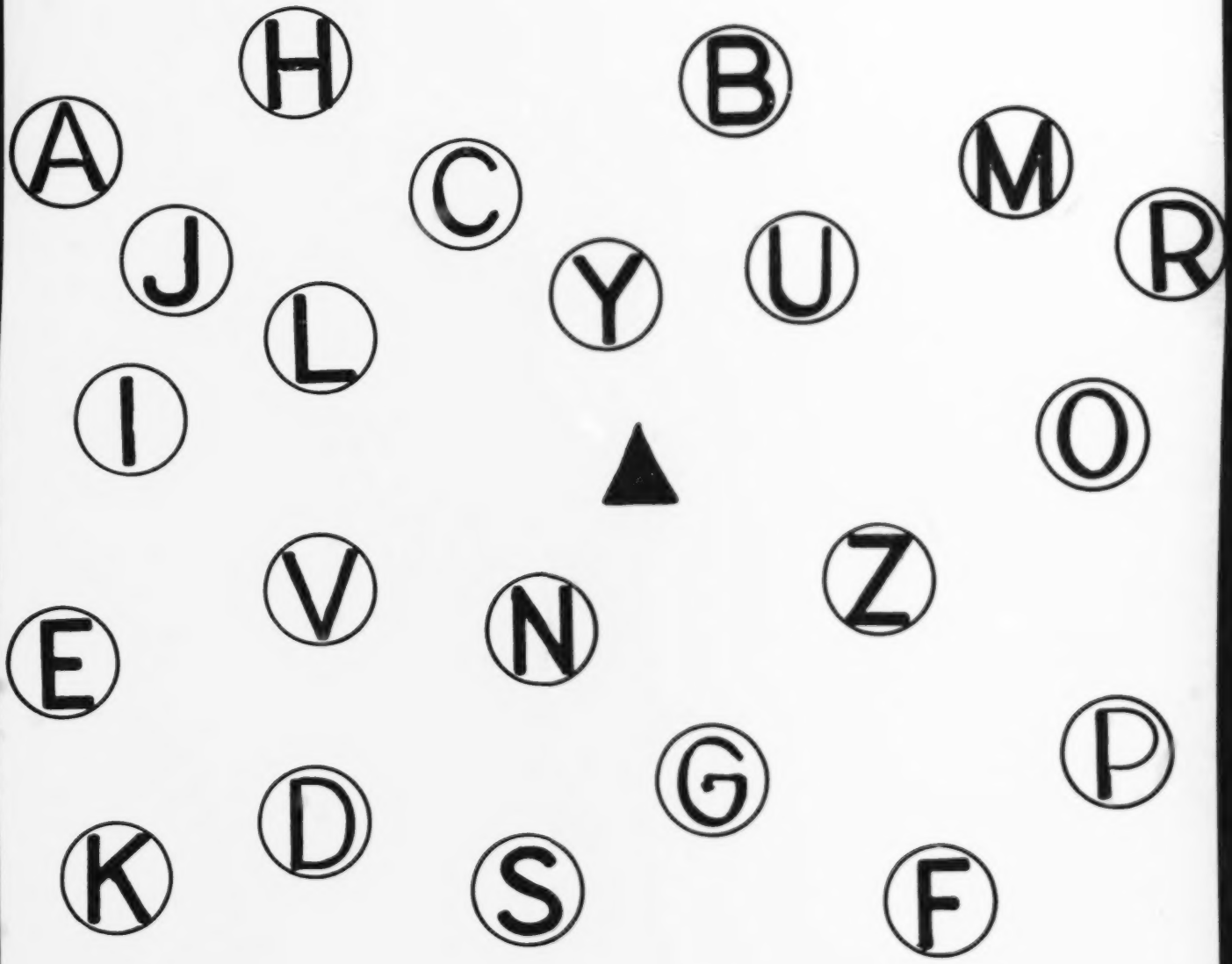


TURTLE NAME FIND



Turtle Name Find

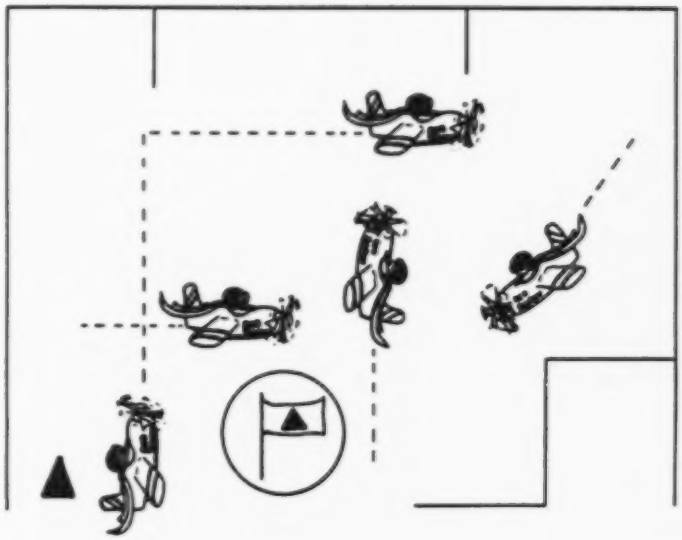
1. Tape transparency to screen so Turtle is at starting position.
2. Move Turtle to find first initial, last initial, spell name, spell words (with or without going through other letters) or make up your own games. Record Turtle movement below.
3. How many commands are needed to complete your mission.



Turtle Name Find

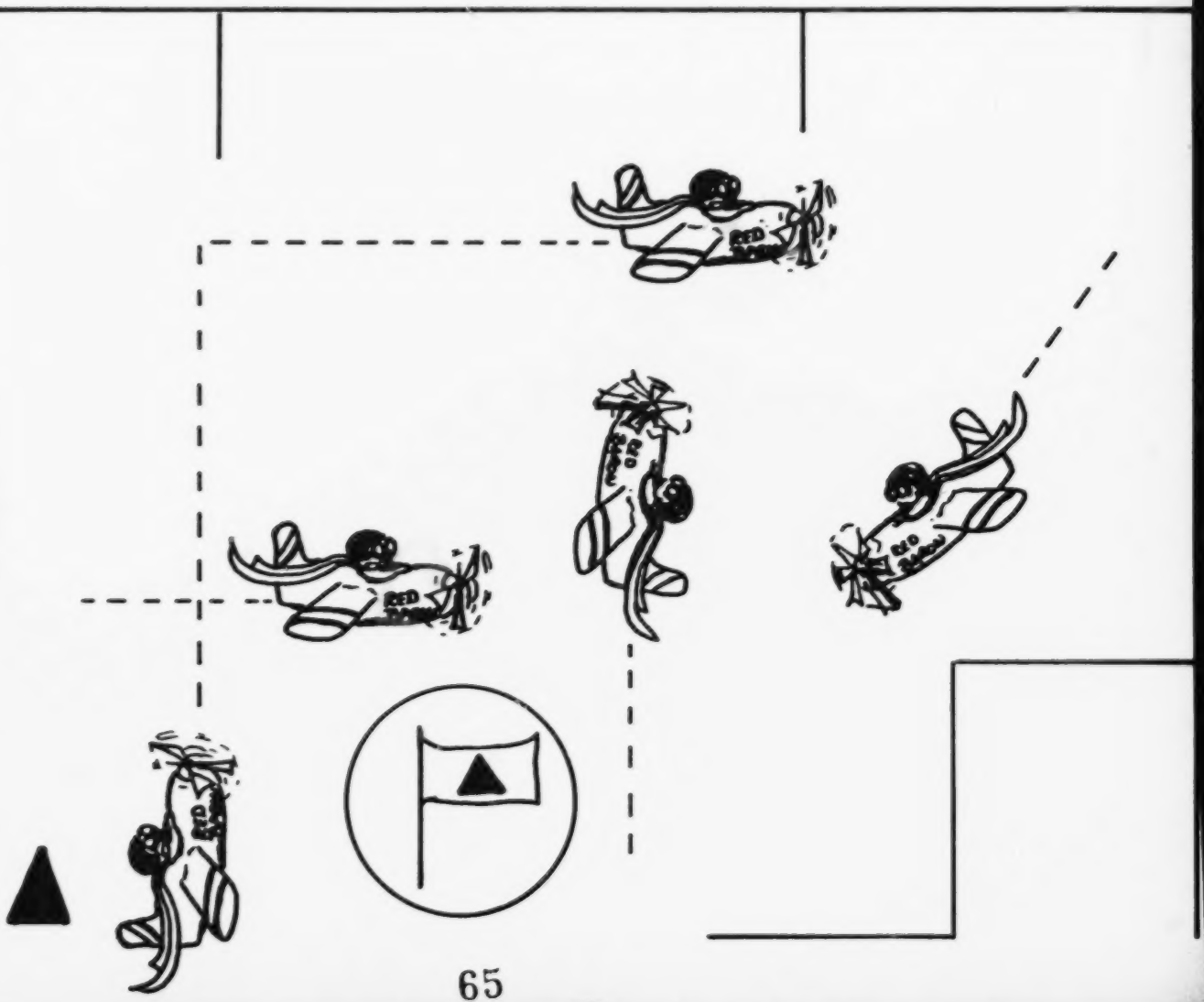
TURTLE vs THE RED BARON

Turtle vs. the Red Baron

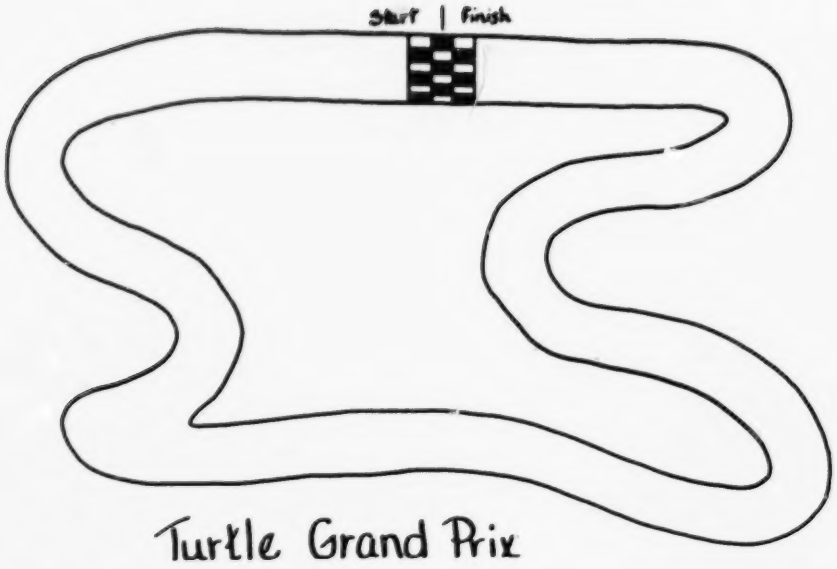


1. Tape transparency to screen and move the Turtle to the starting position.
2. Return the Turtle safely to the Airbase by avoiding The Red Baron. Record Turtle moves.
3. You run out of fuel after eight moves. How long (how many moves) did you take to return the Turtle to the Base.

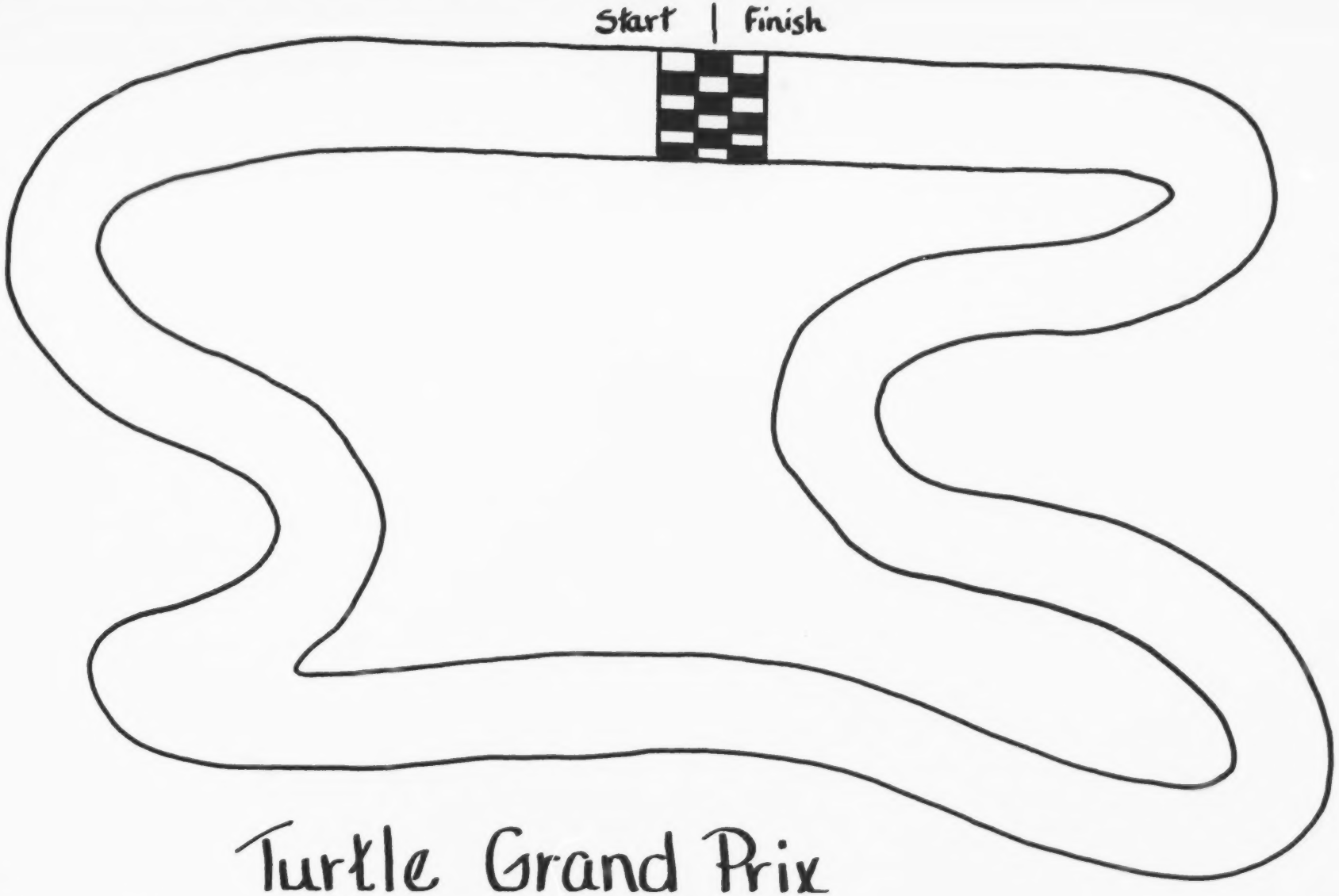
Turtle vs. the Red Baron



TURTLE GRAND PRIX



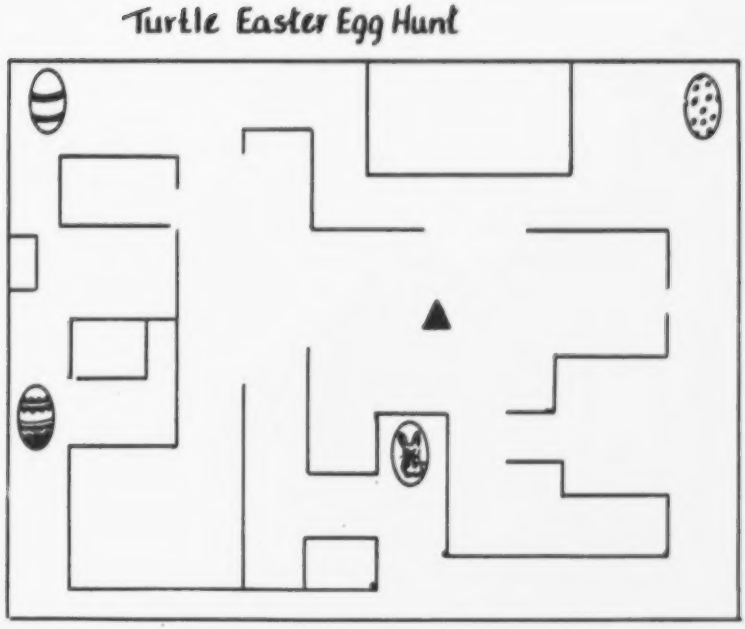
1. Tape transparency to screen and move Turtle to starting line.
2. "Race" the Turtle to the finish without running off of the track. Record commands below.
3. The race leader has a time of 15 moves. How many moves did the Turtle make? _____



Turtle Grand Prix

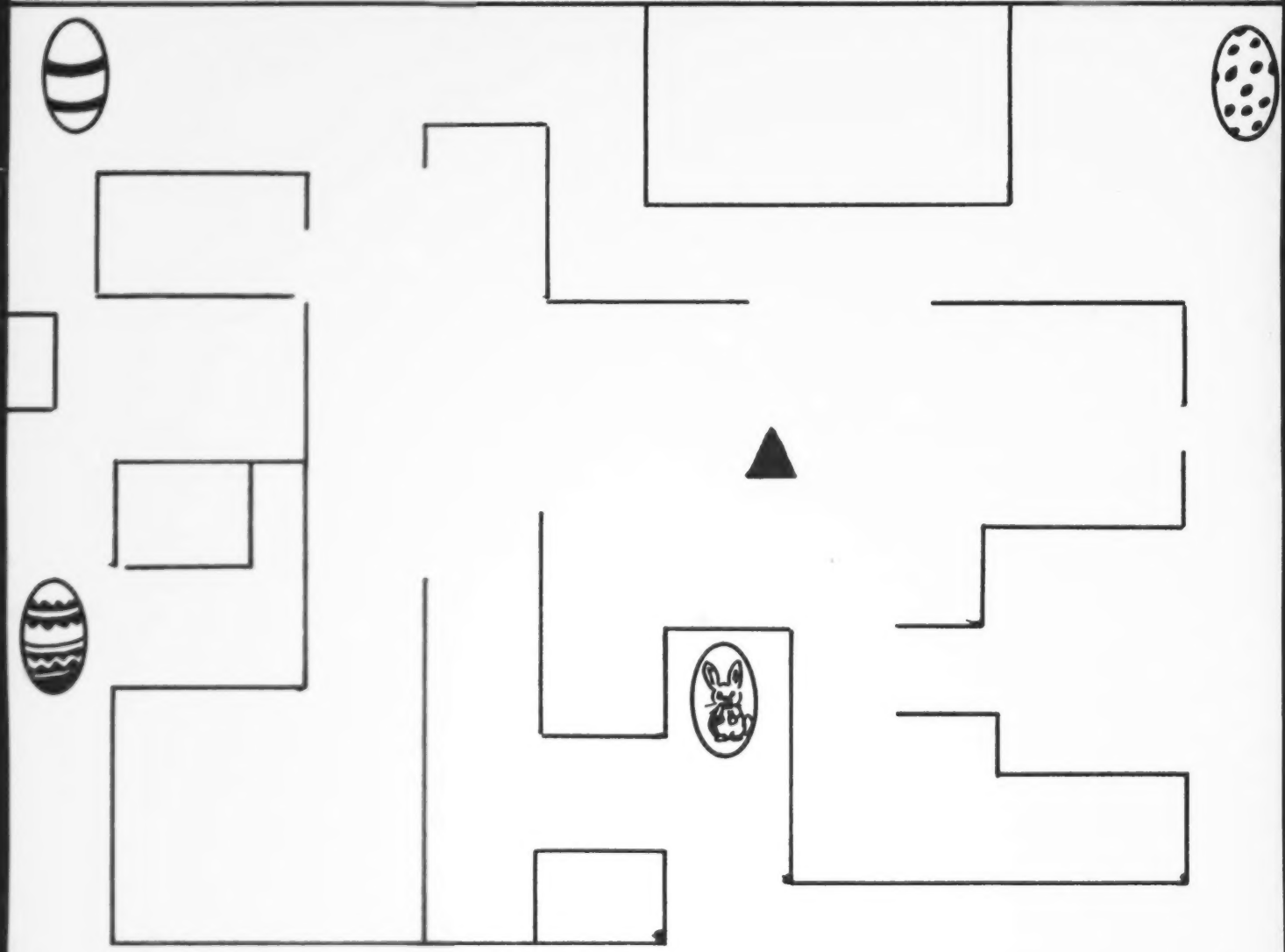
56A

TURTLE EASTER EGG HUNT



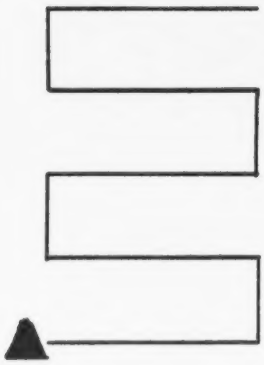
1. Tape transparency to the screen so the Turtle is in the starting position.
2. Help the Turtle find the eggs and return to the start. Record commands below.
3. What number of degrees did you use to return?
4. How many moves did Turtle have to make to collect one egg?_____ Four Eggs? _____

Turtle Easter Egg Hunt



TURTLE PATTERNS

Trace the following patterns and return the Turtle to the original position by retracing commands.



Zipper

Snake

Lighting

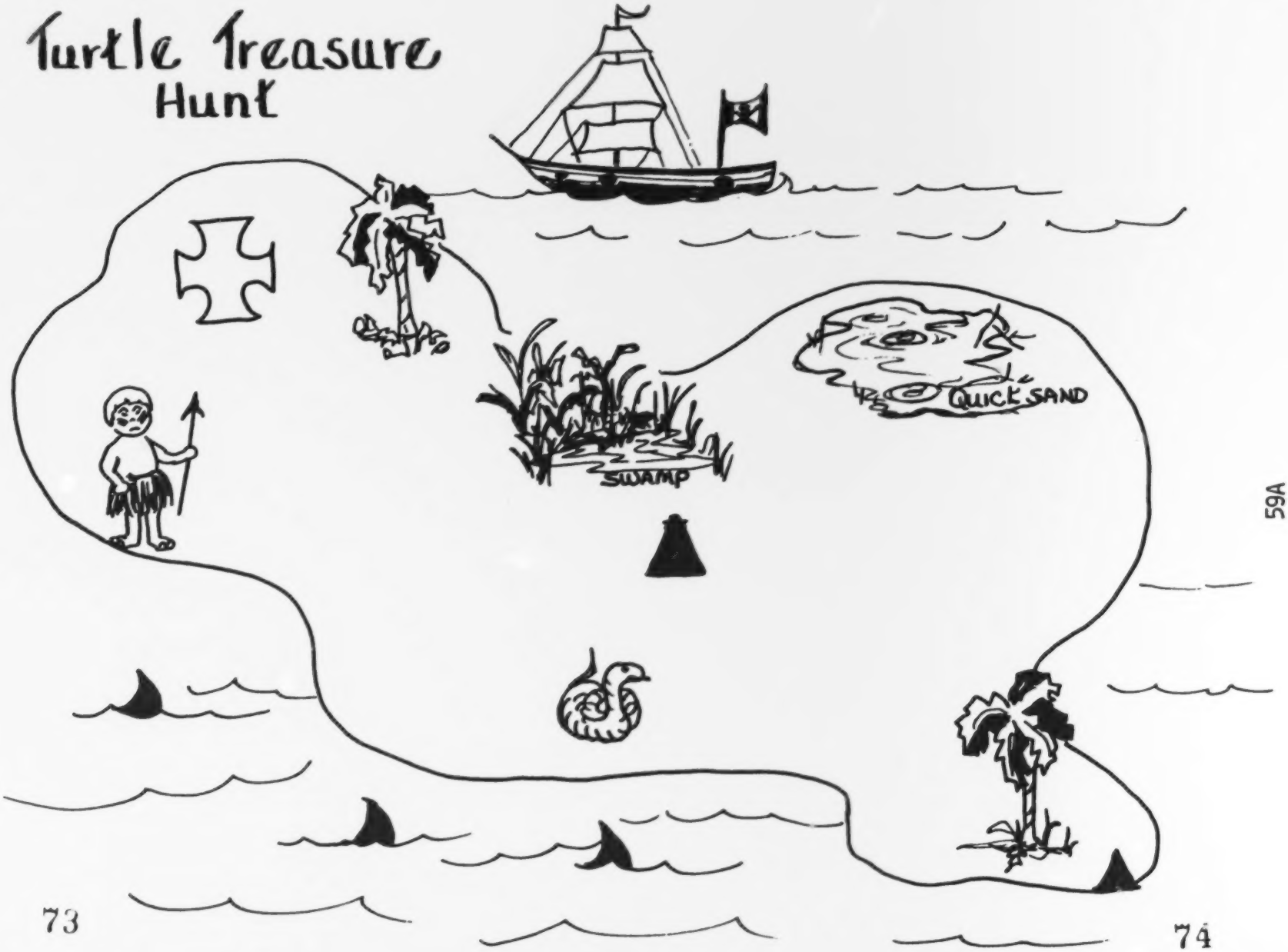
Lollipop

TURTLE TREASURE HUNT

Tape the transparency to the screen so the triangle is on top of the Turtle in its home position.

1. Turtle is seeking the pirate treasure. Move the Turtle to the beach (beginning) (Do Not count these moves)
2. Move Turtle forward to find the treasure. Move any direction you want but avoid the obstacles and the water.
3. If you land in the water or in an obstacle you must back out to continue. Backward moves count.
4. The treasure is marked by the X. Whoever gets to the treasure in the fewest moves wins.

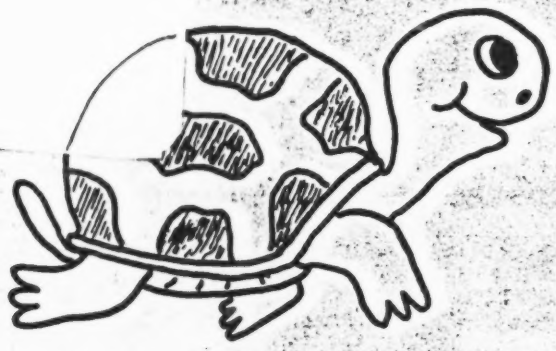
Turtle Treasure Hunt



59A

One Key Logo

NON-VERBAL



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ITV Services

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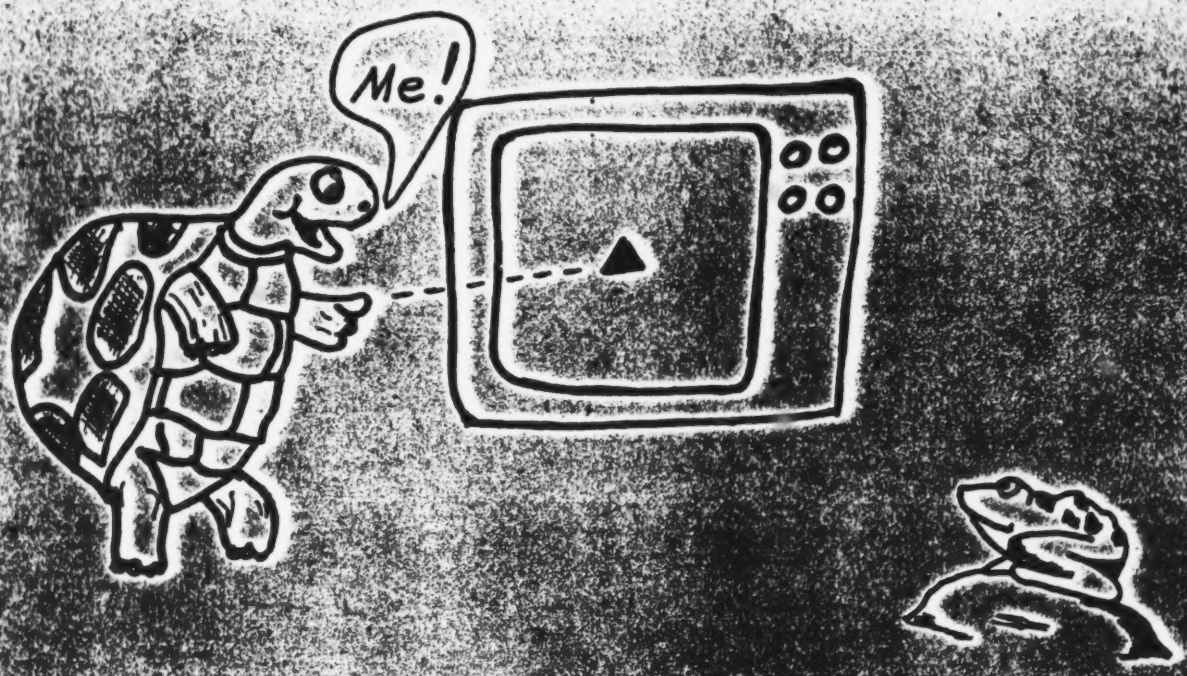
One Key Logo

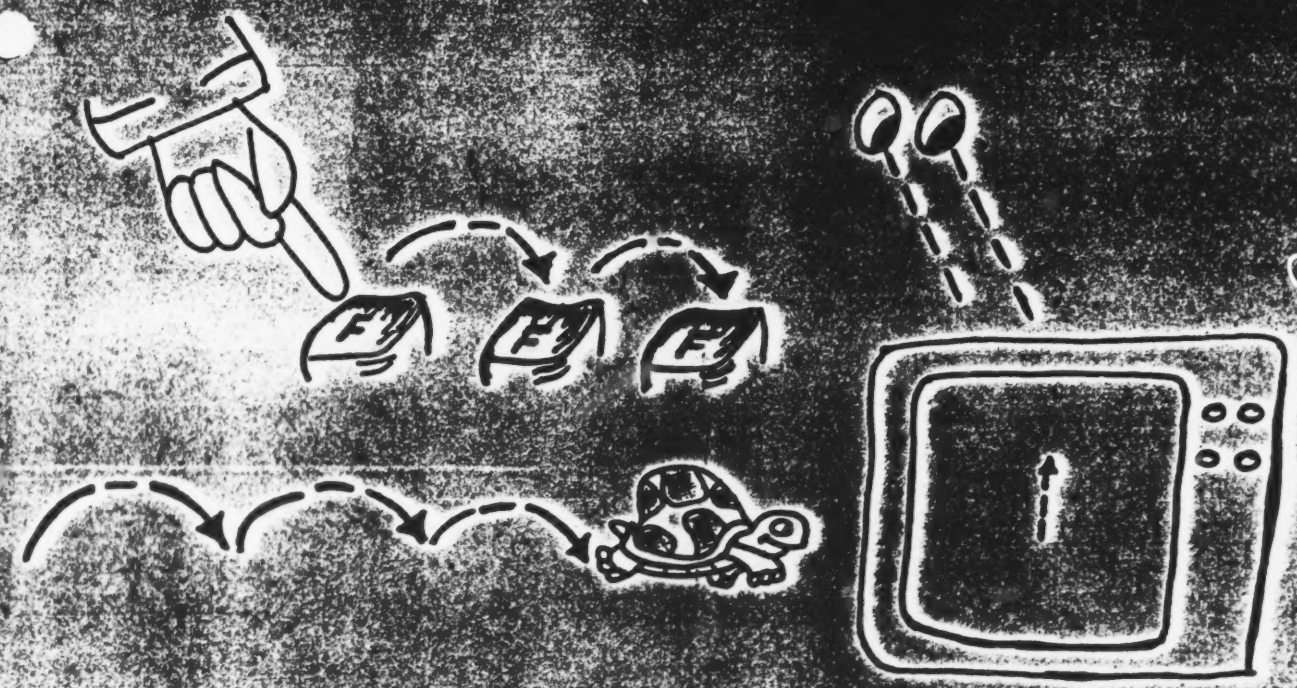
is a Logo Language modification designed to acquaint the computer novice with graphic programming.

This set of hands-on activity cards will guide a pre-reader or primary child through step by step progression into the creative adventure of problem solving.

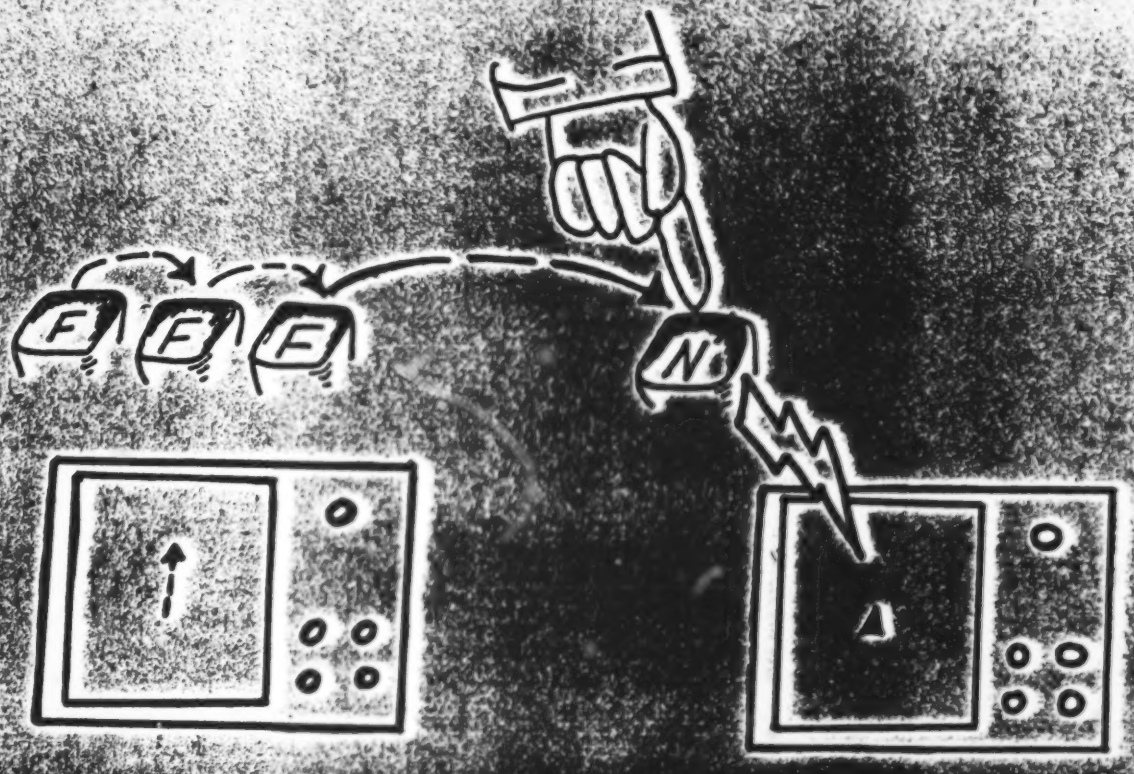
A-1



A-2



A-3



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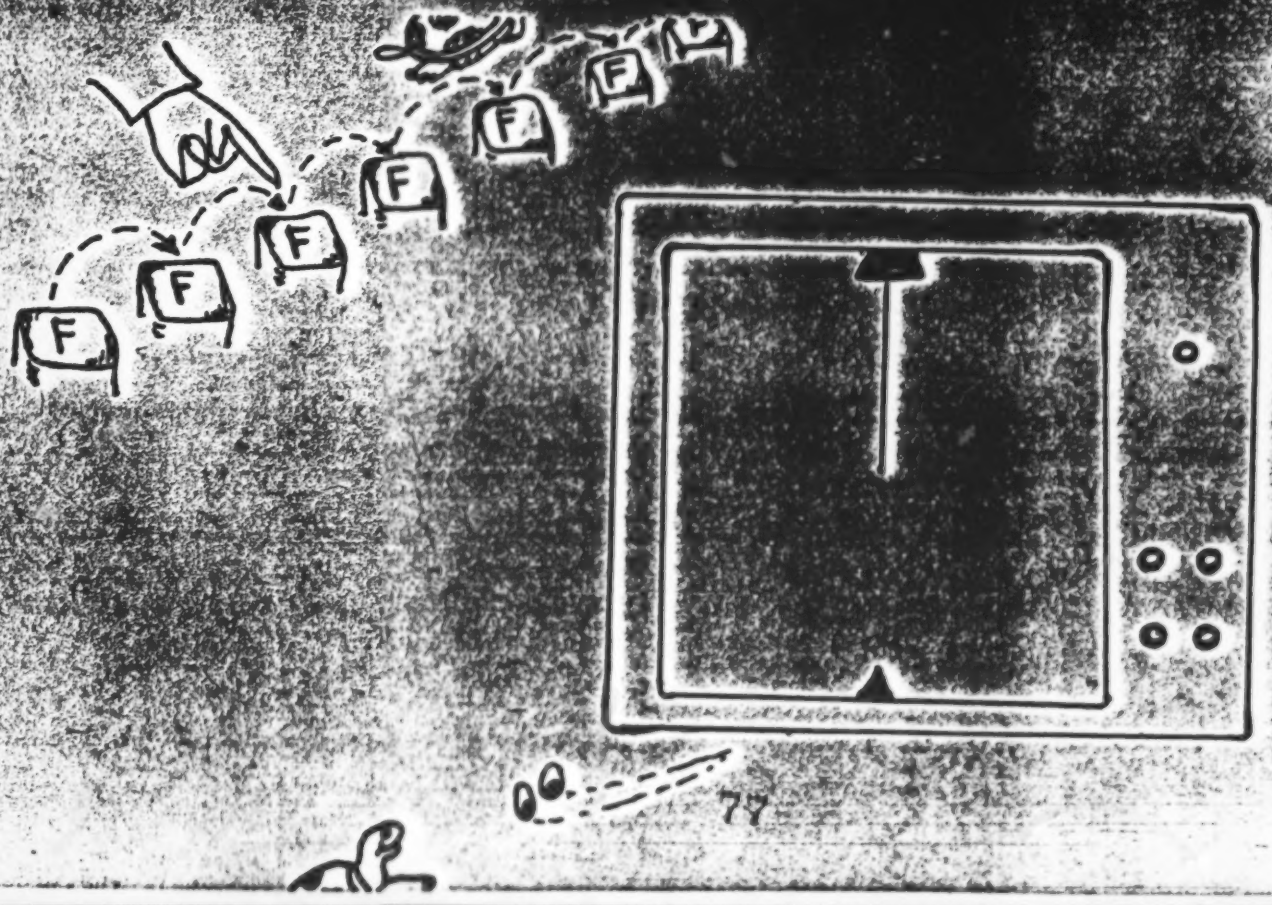
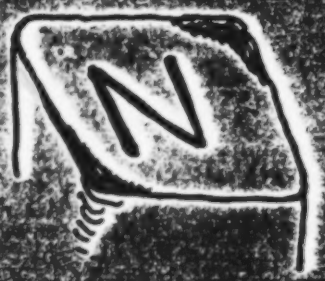


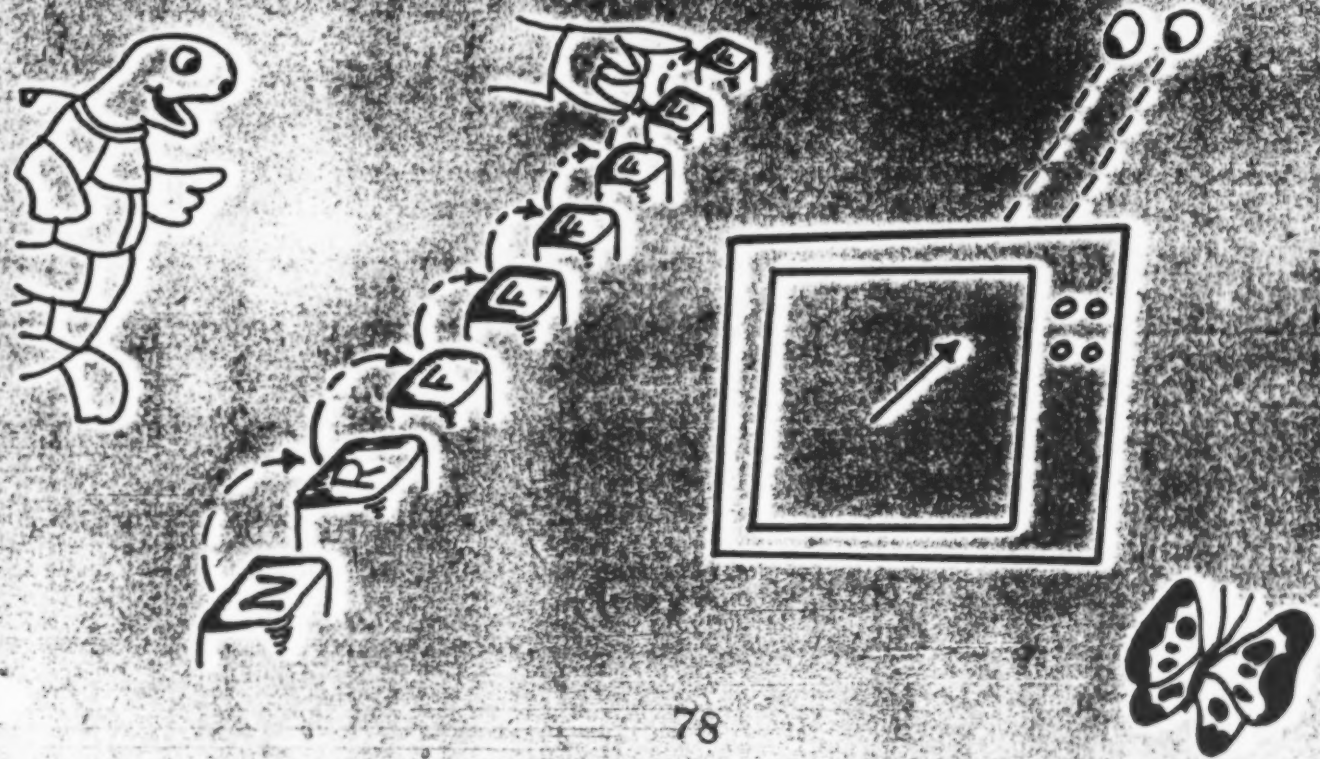
A5

Forward

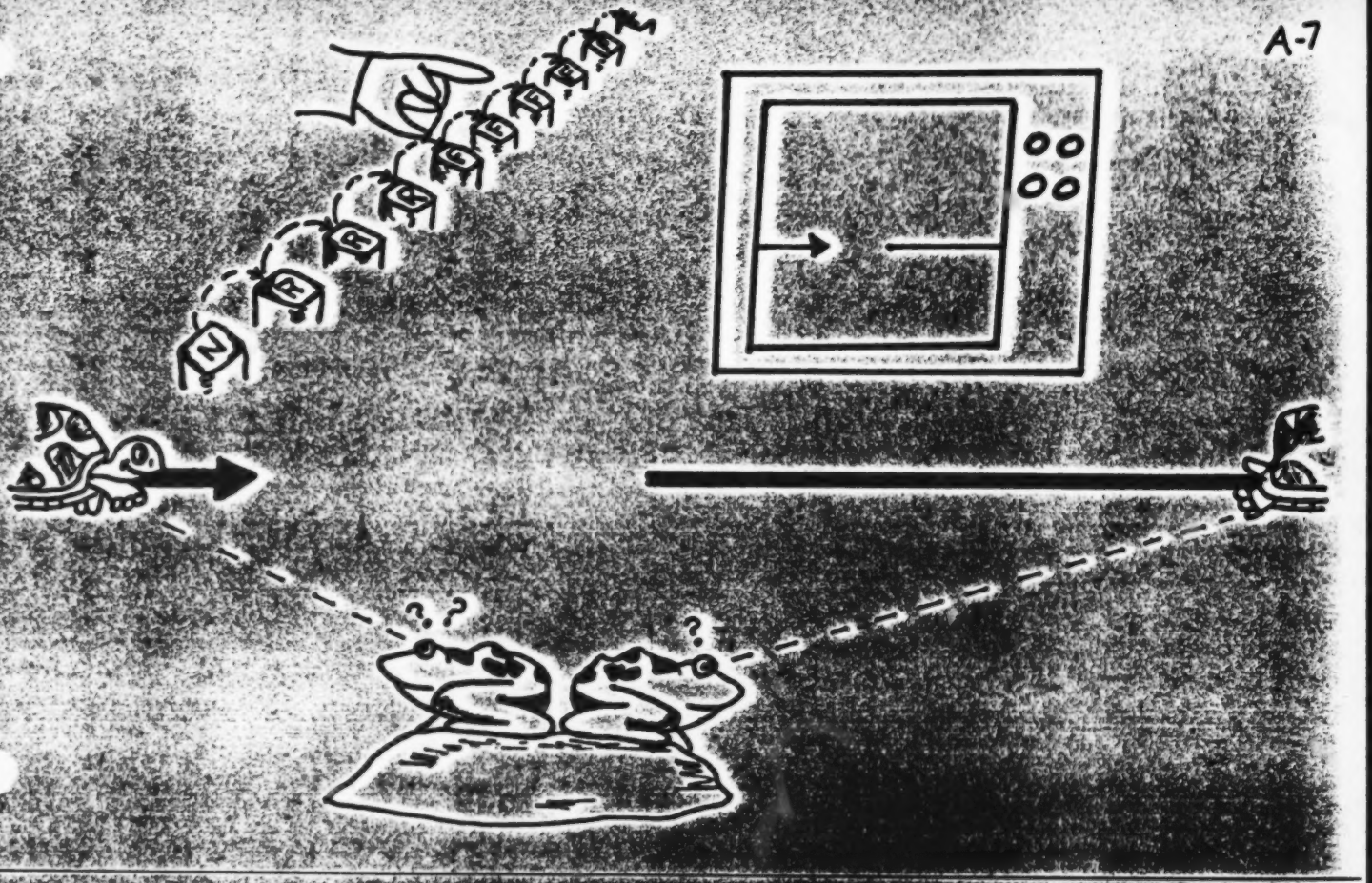


New

A-6



A-7



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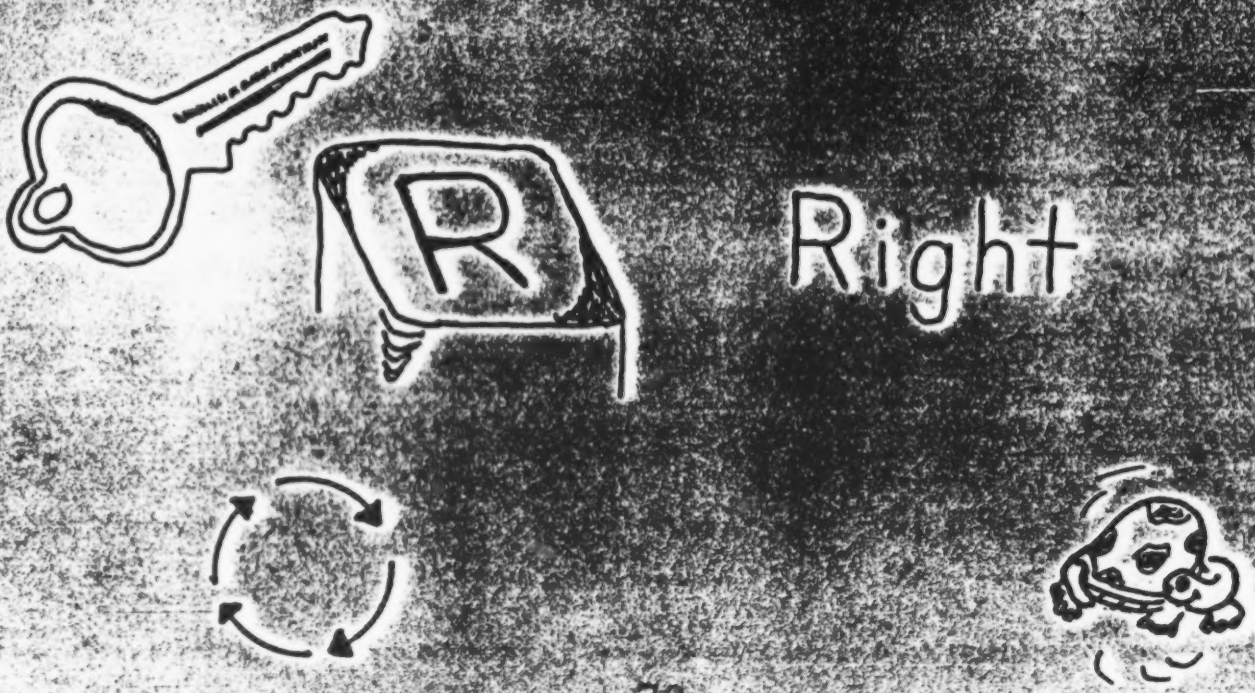


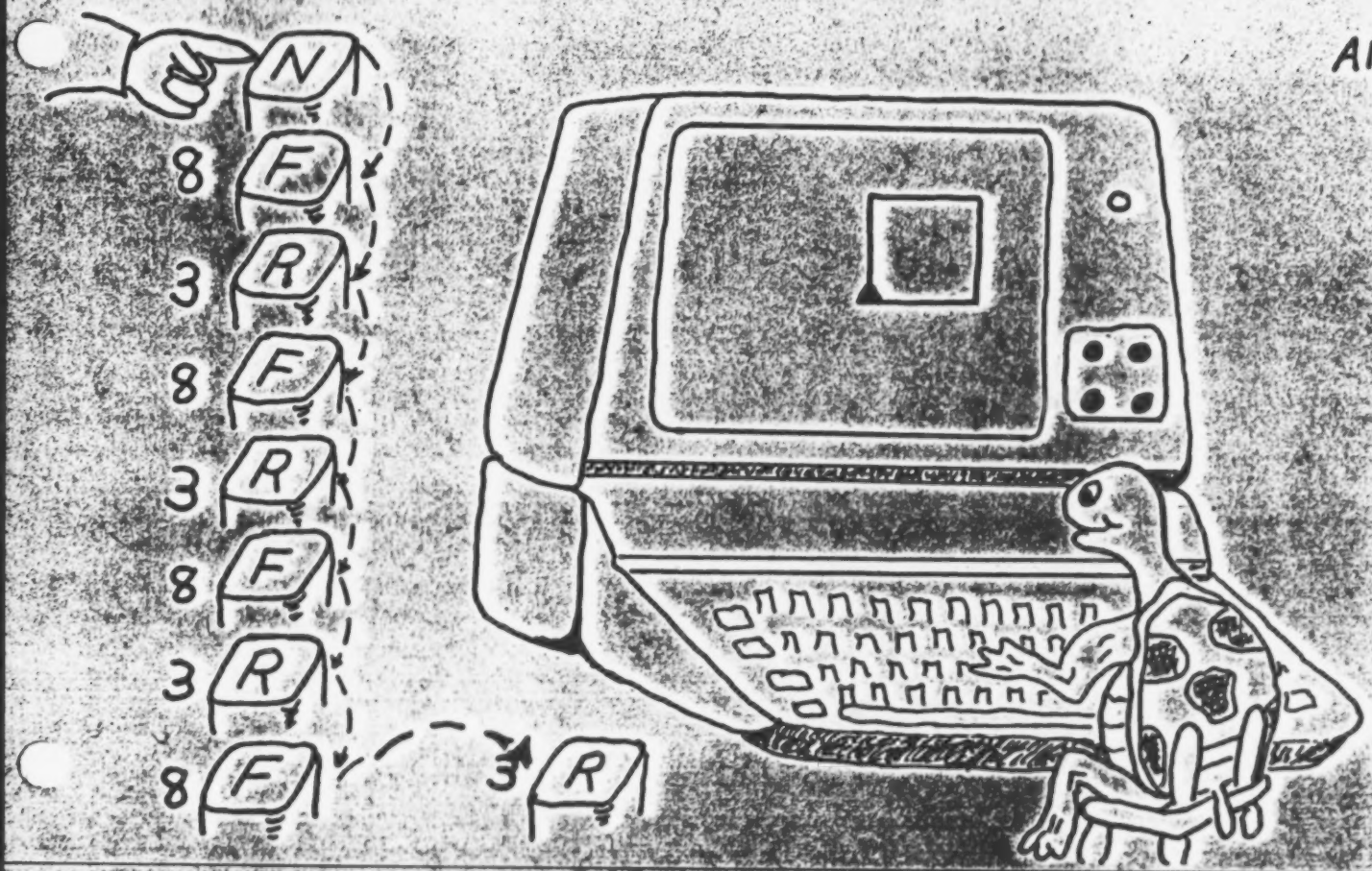
A-9

A10

A11

A12

A13



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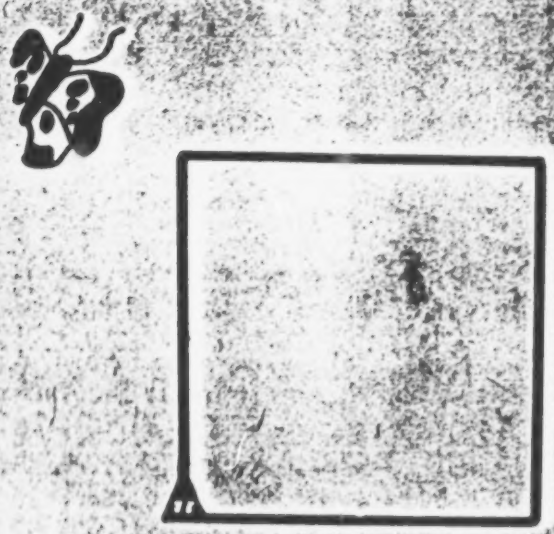
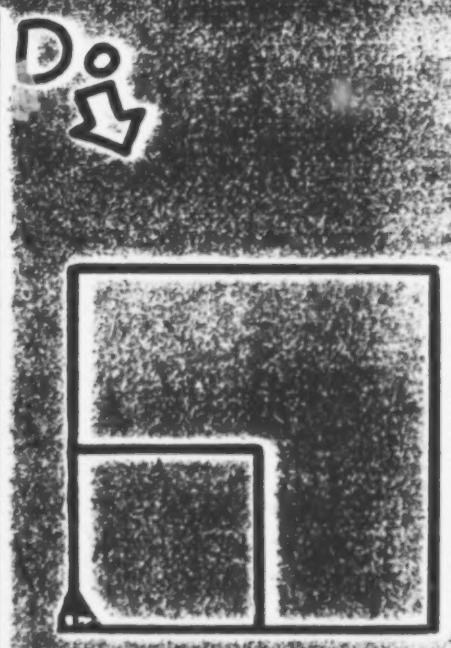


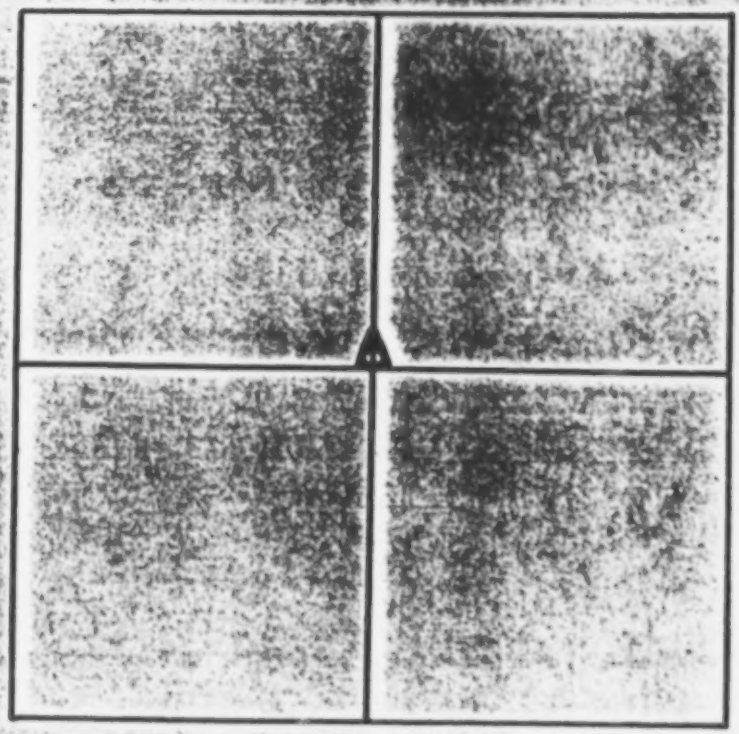


A15

Do

A16

Do



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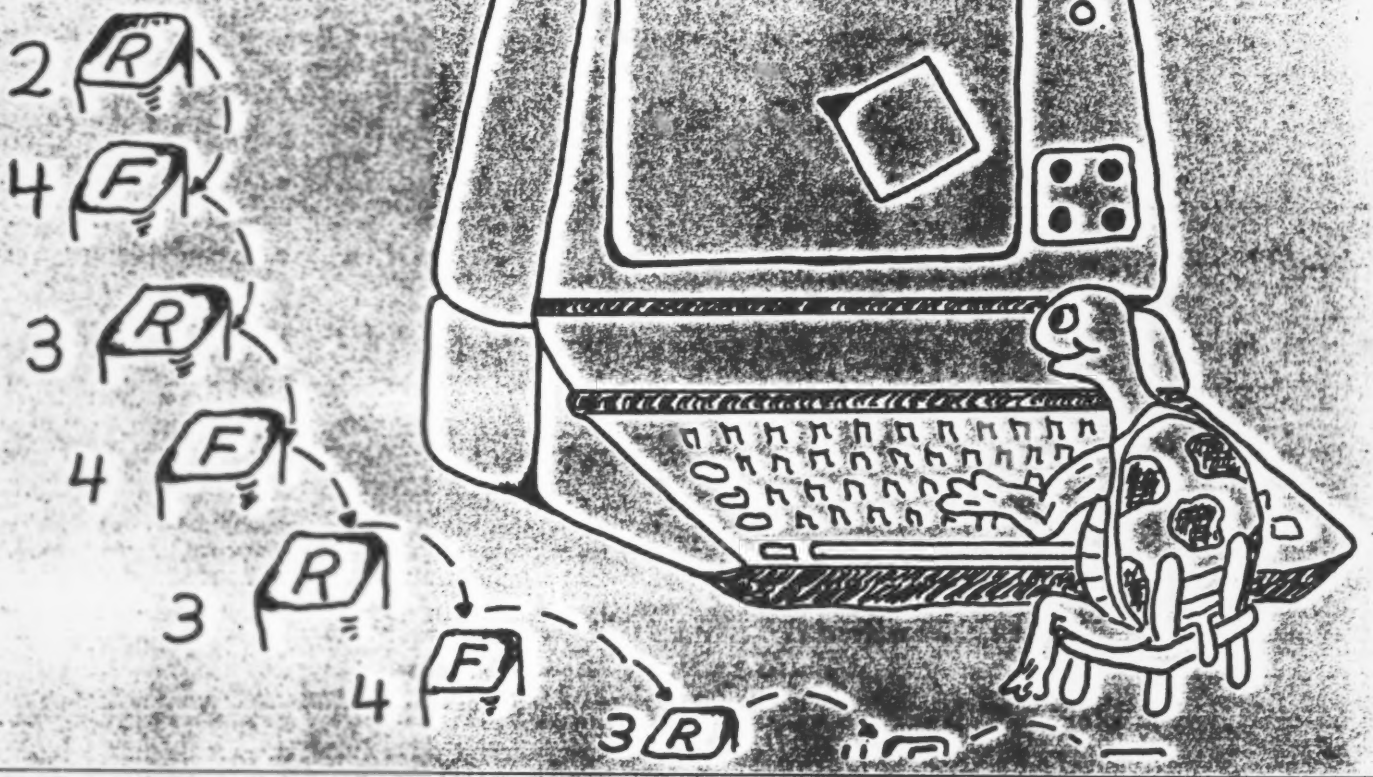

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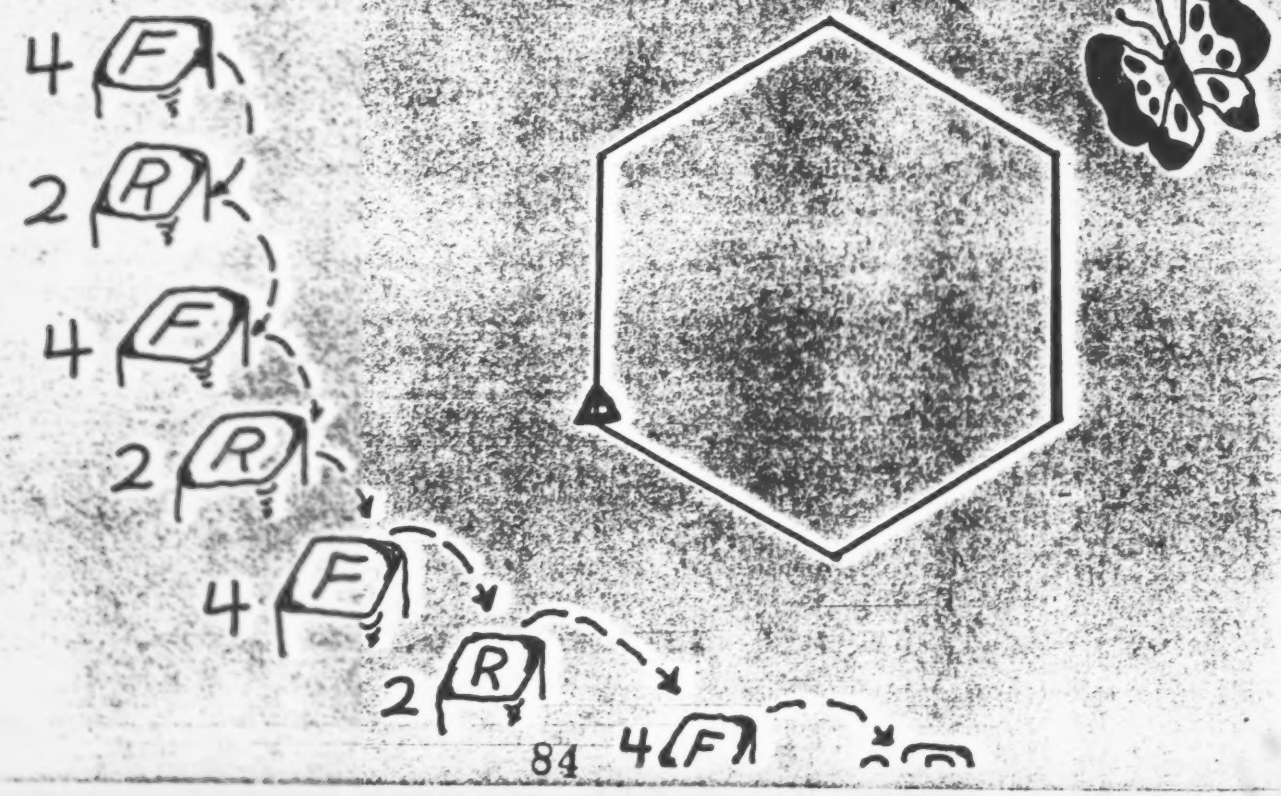

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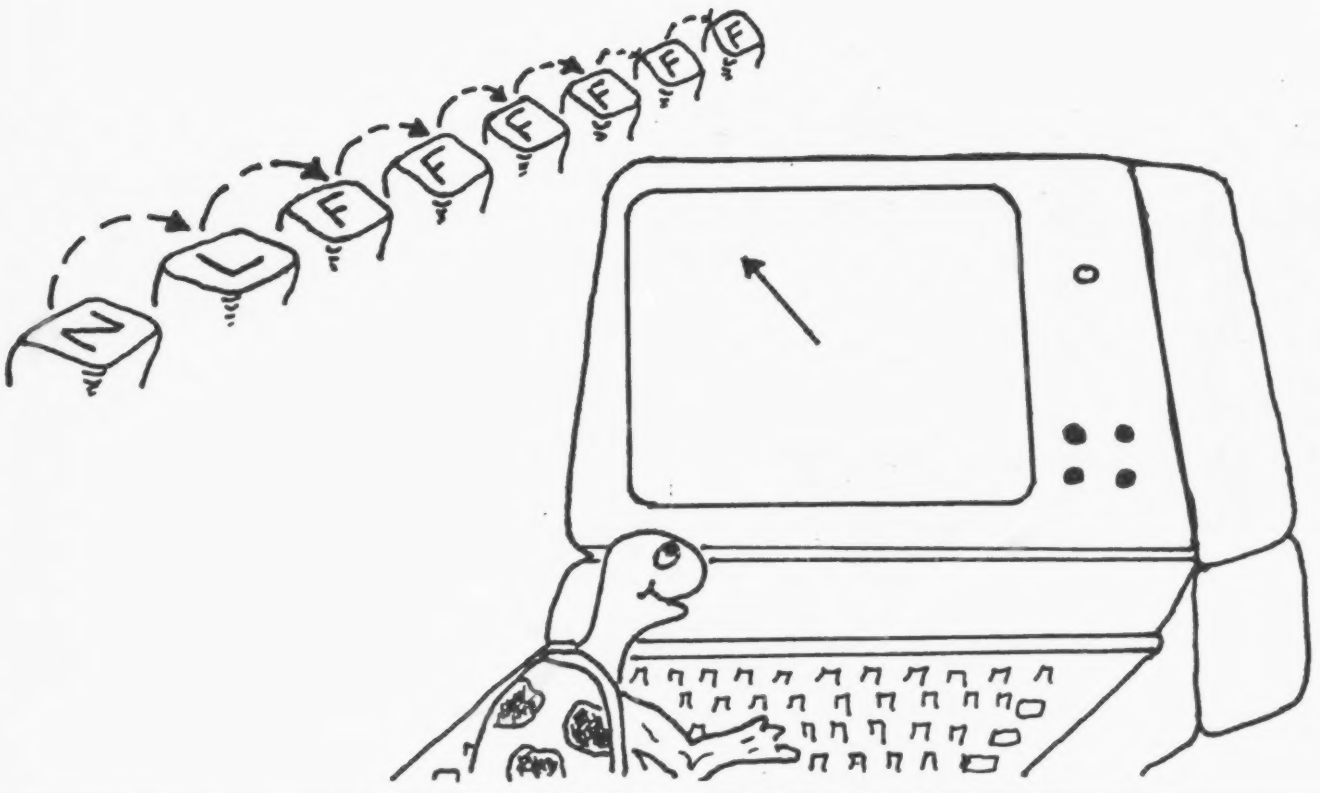

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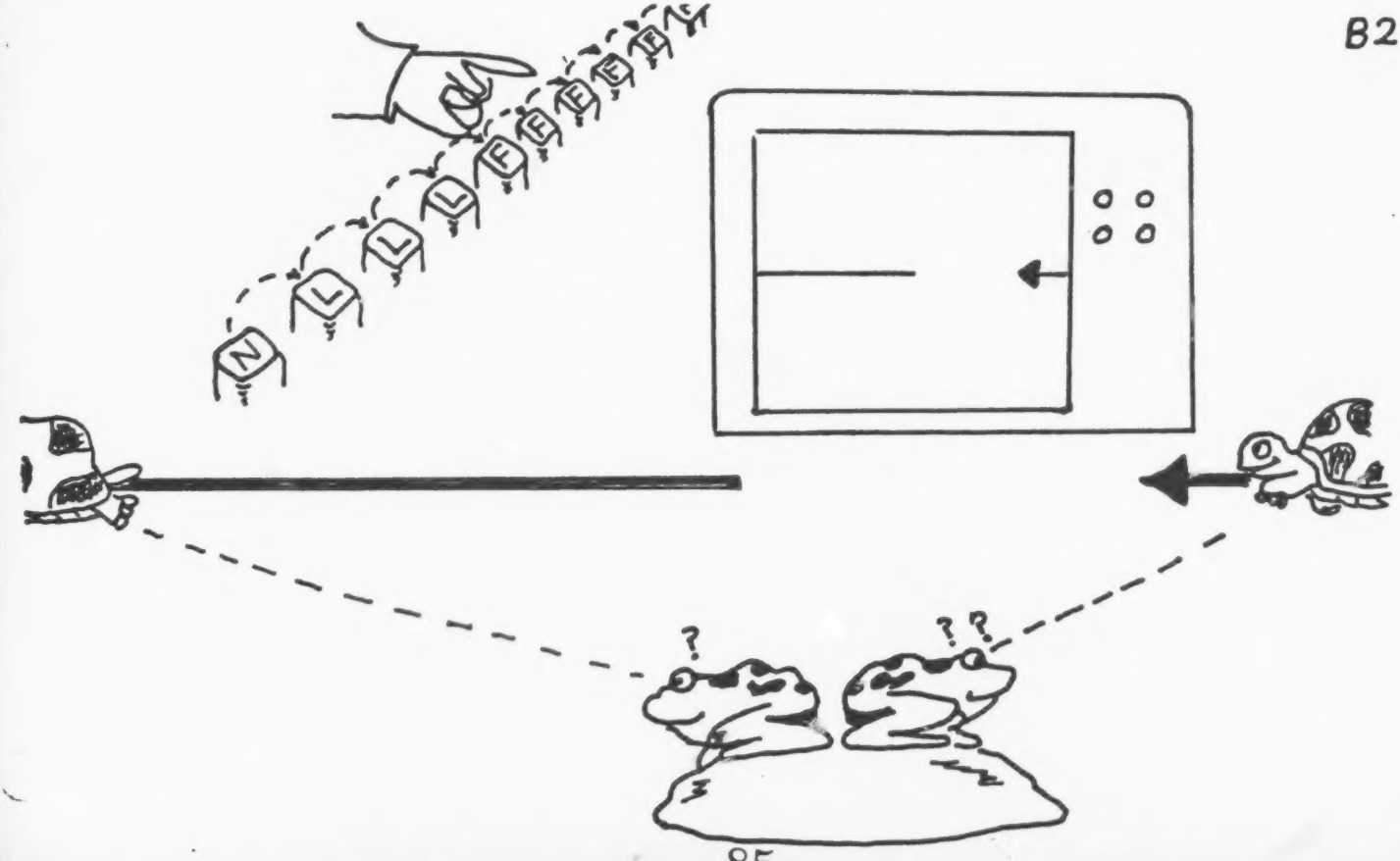

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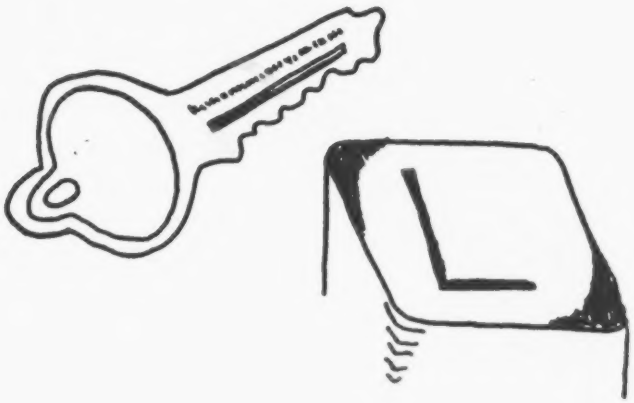

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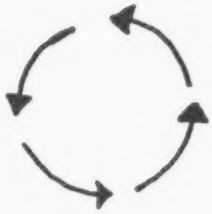

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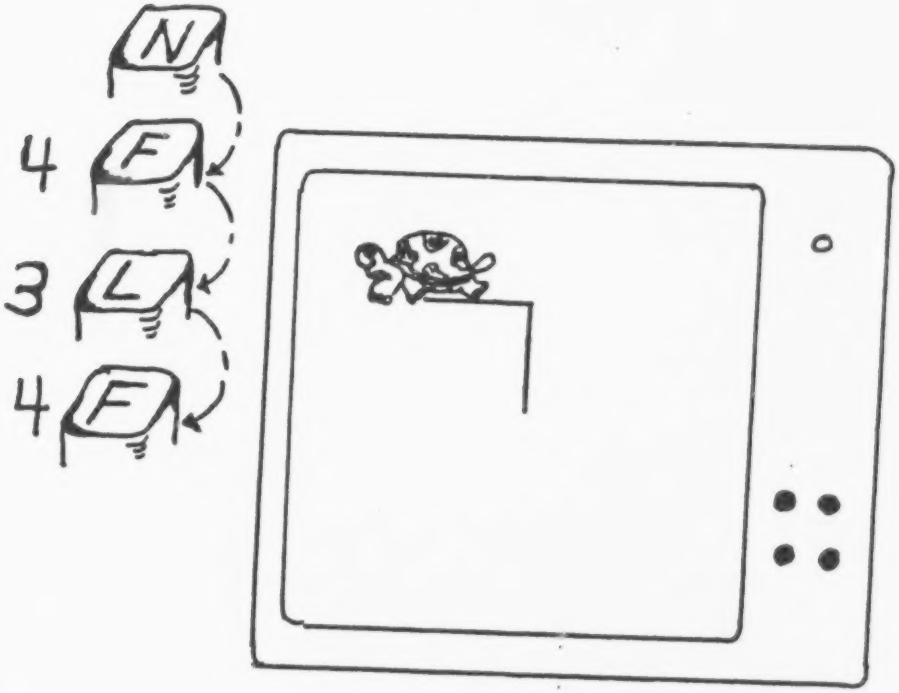

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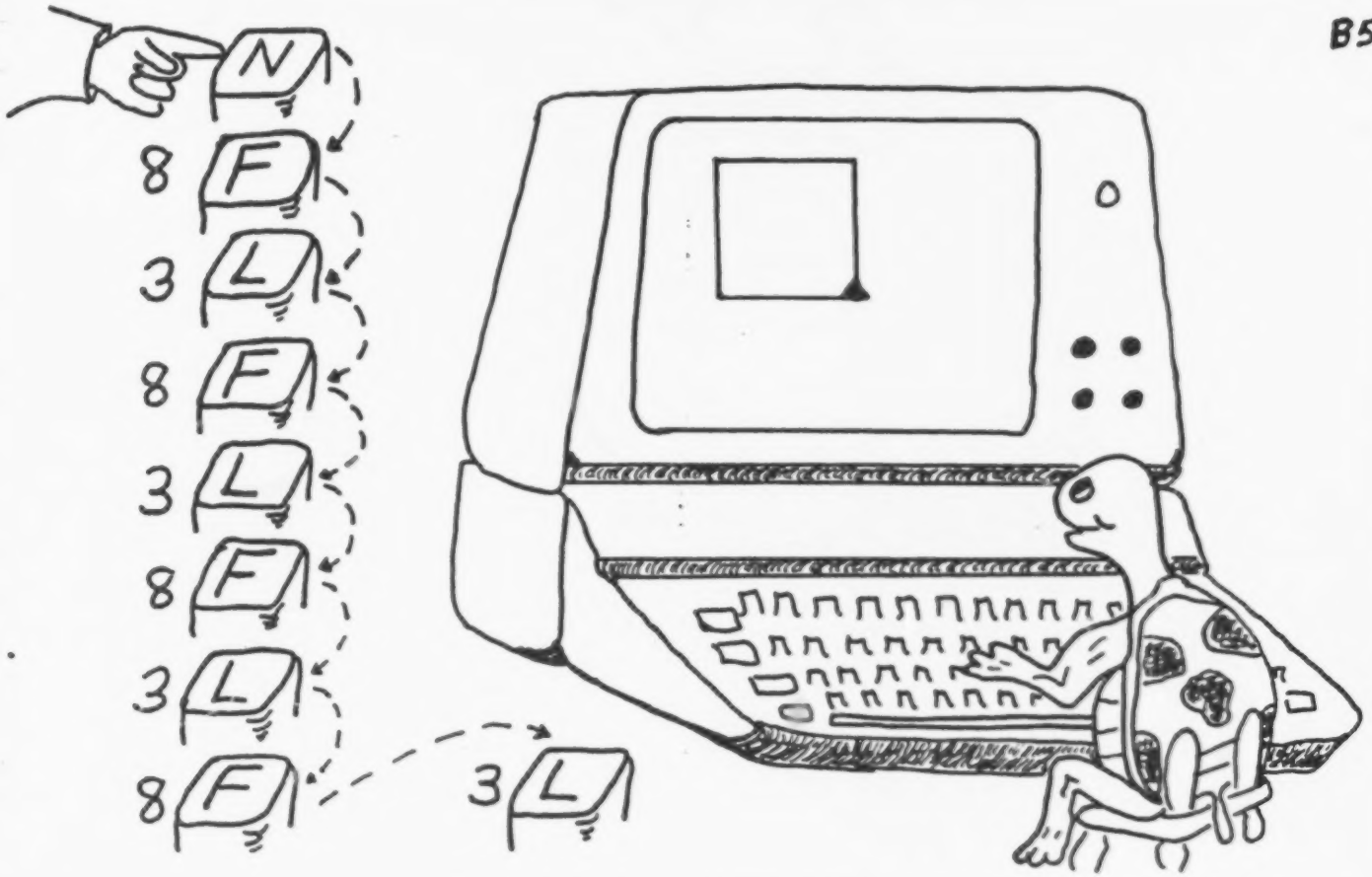

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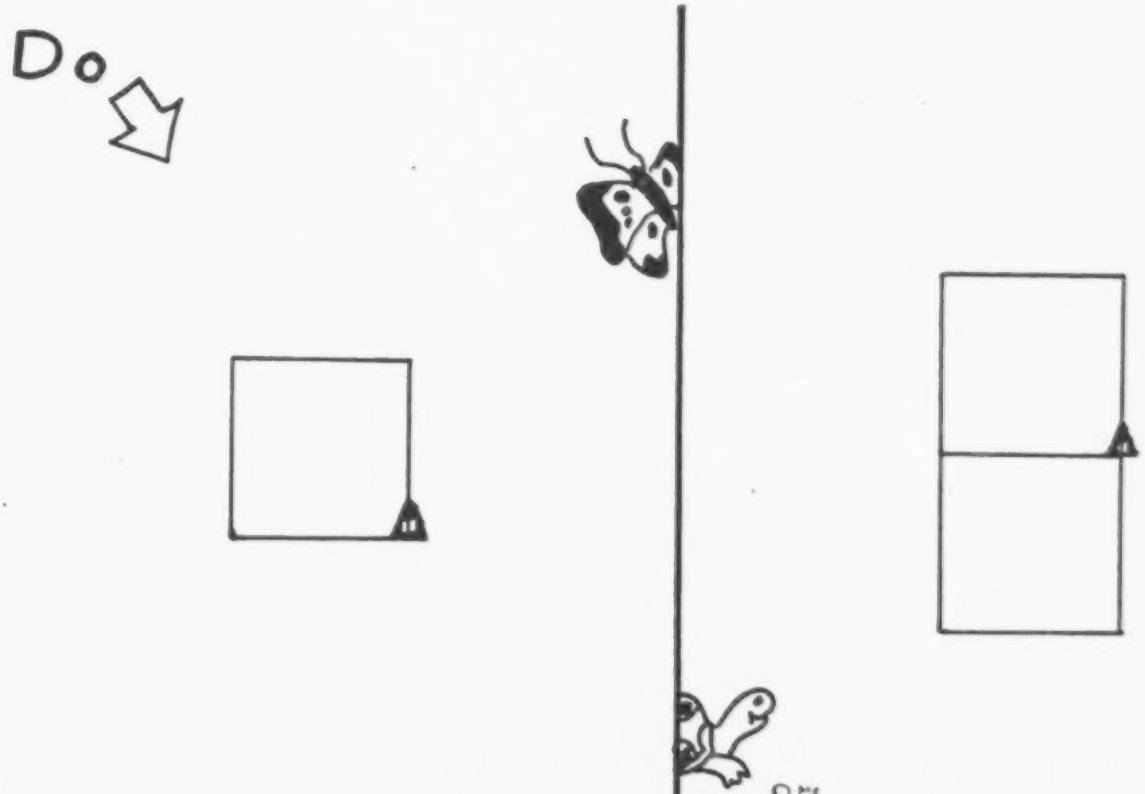

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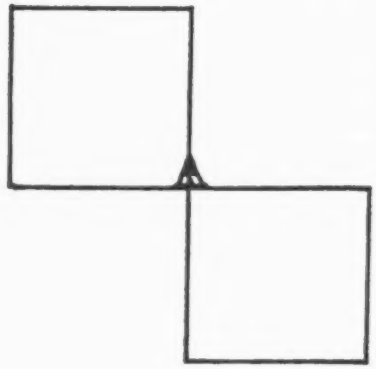

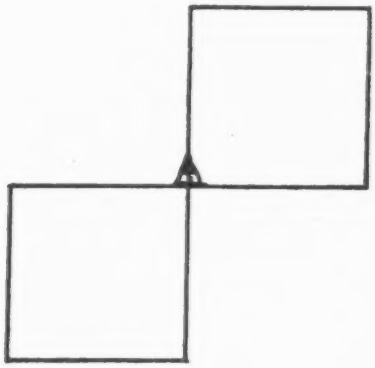

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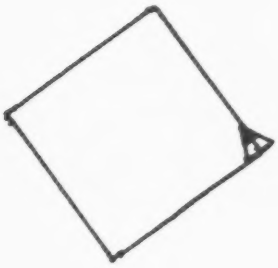
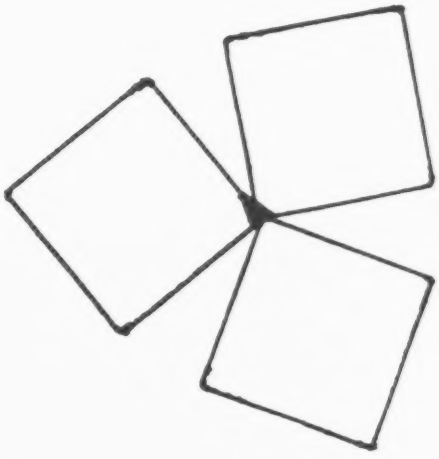




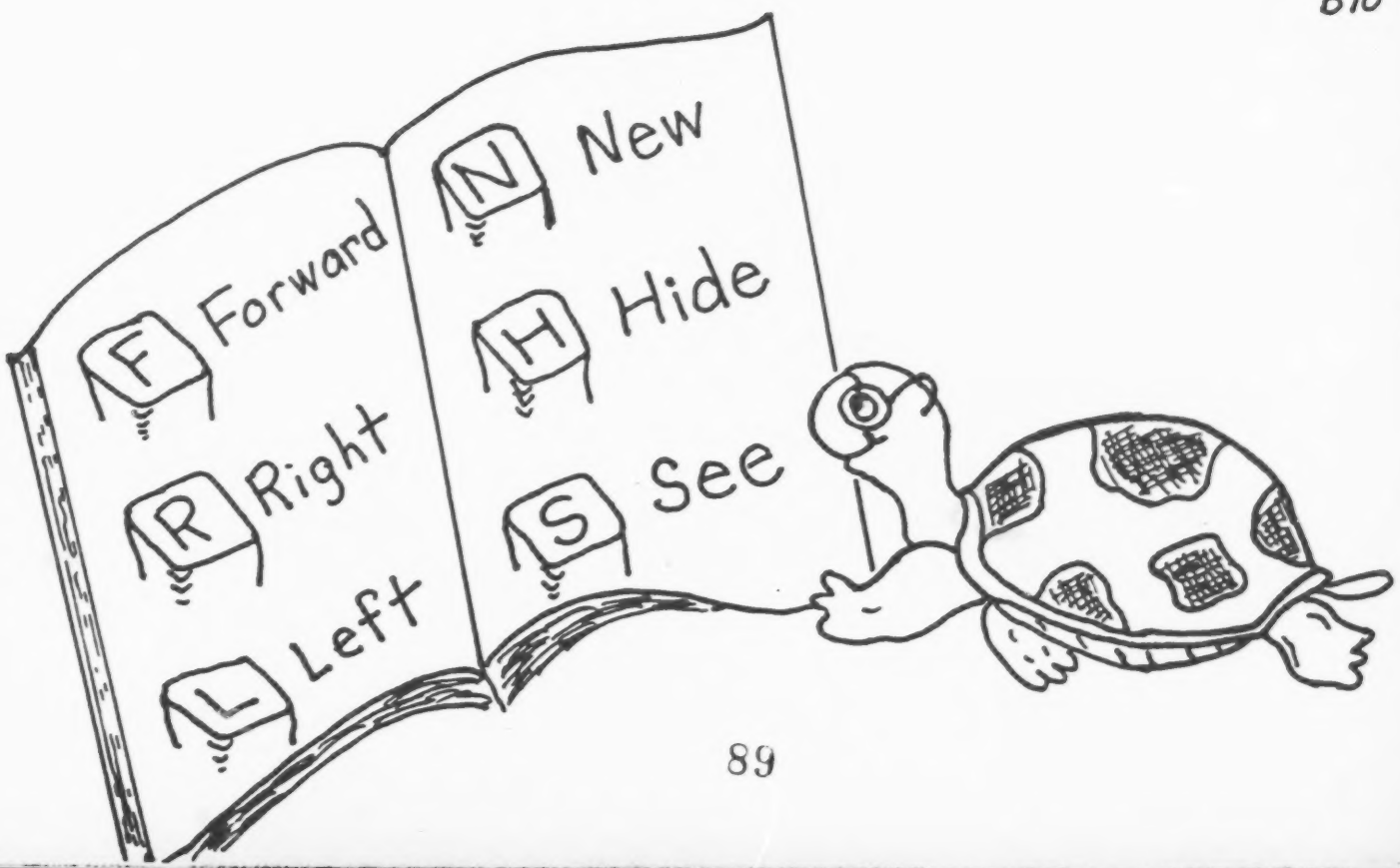
B9

Do

T

H

B10



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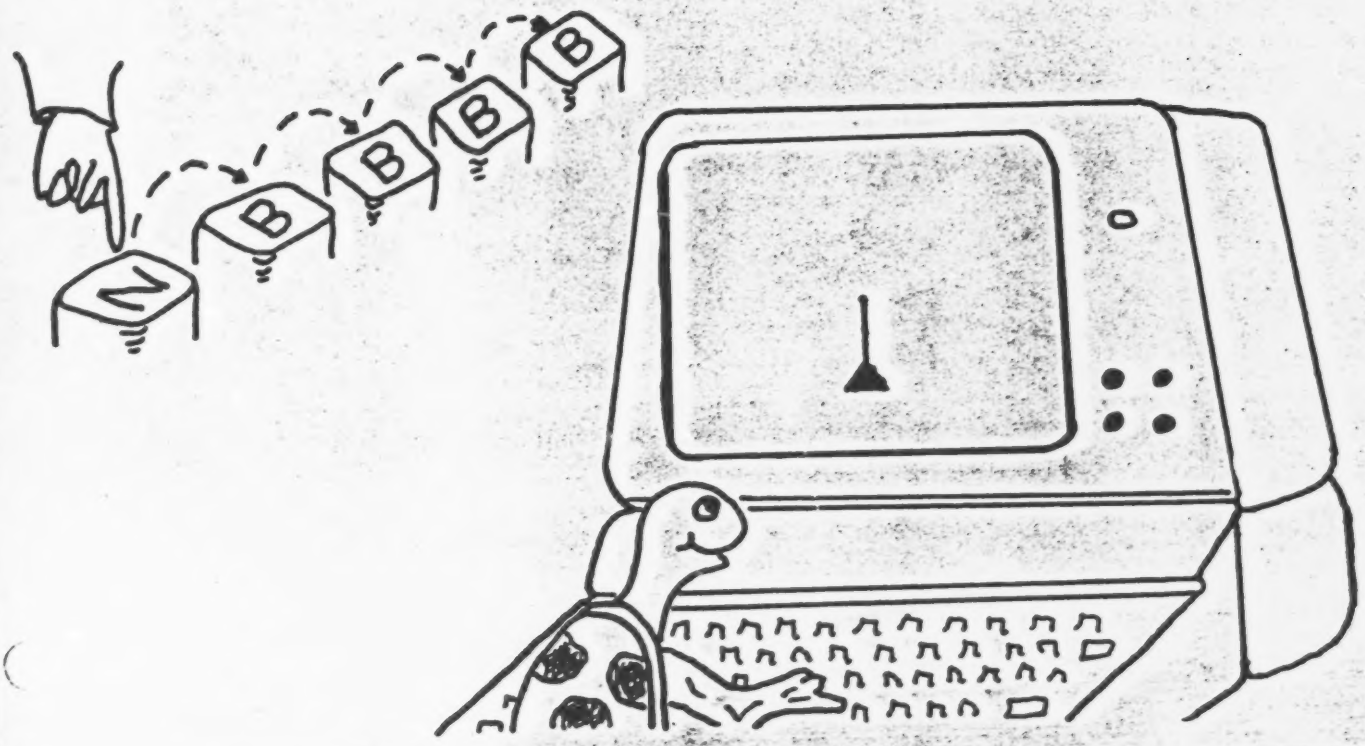

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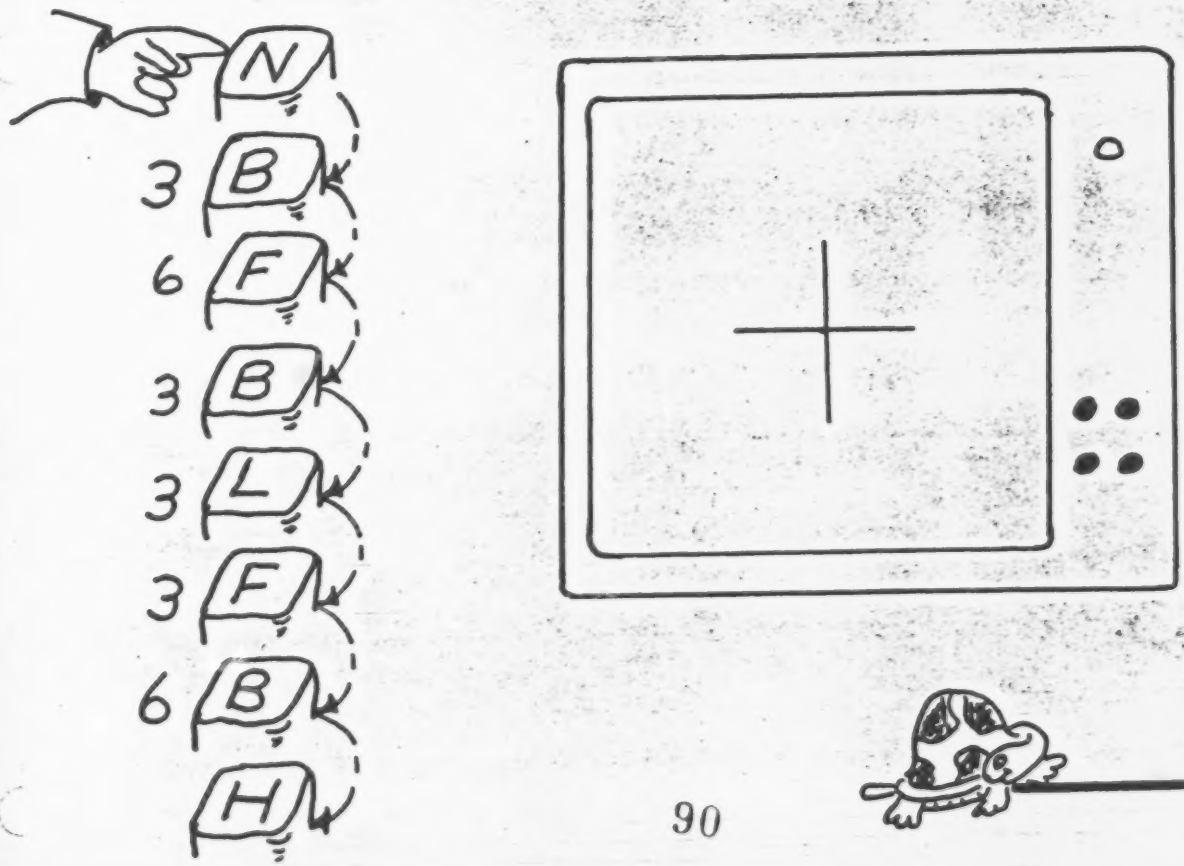
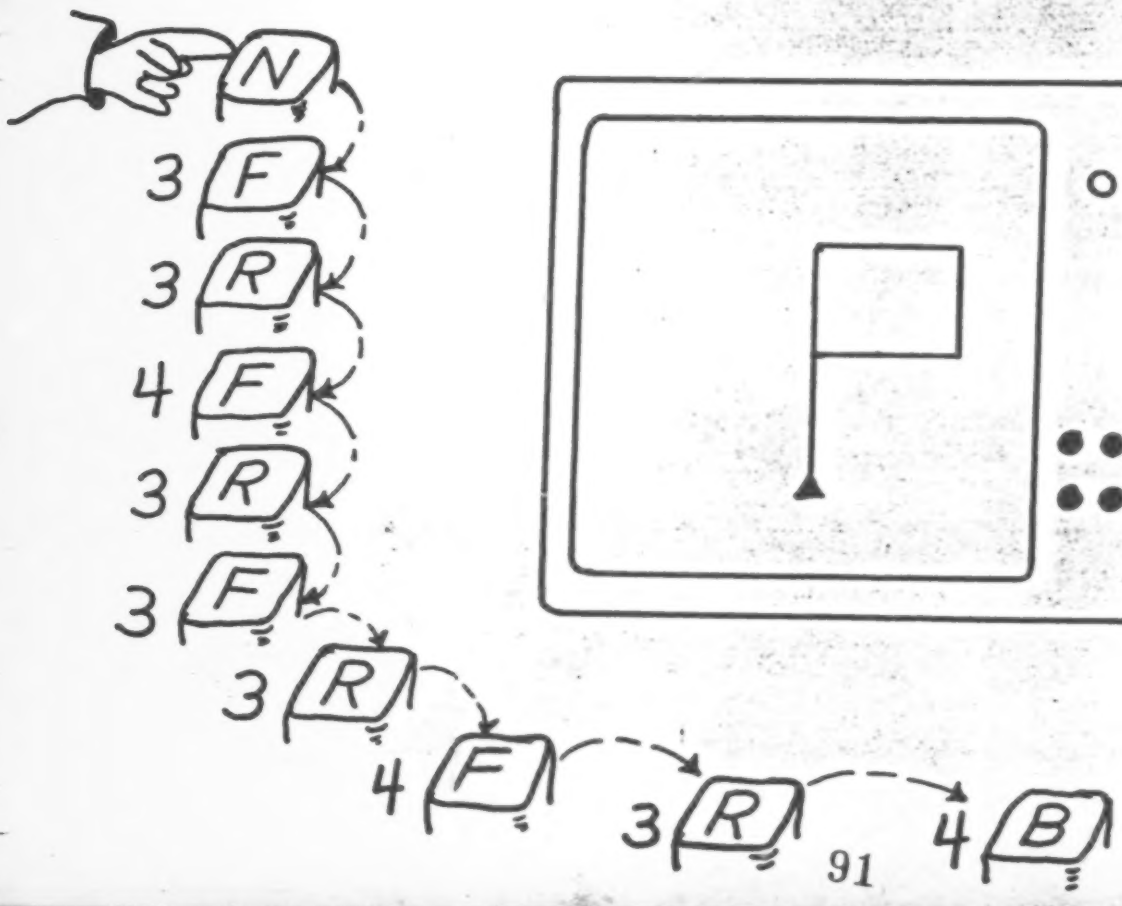


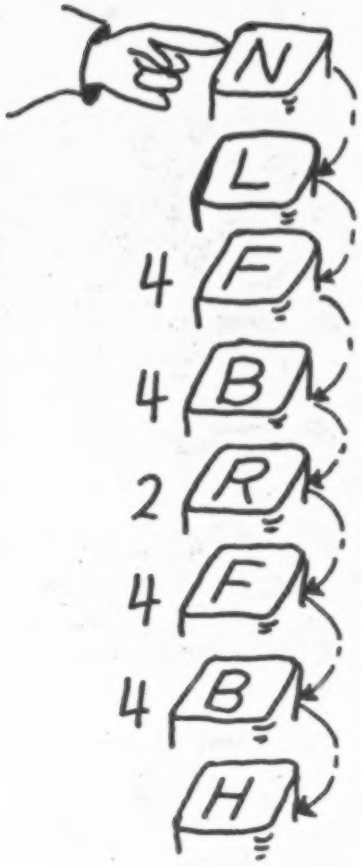
C3

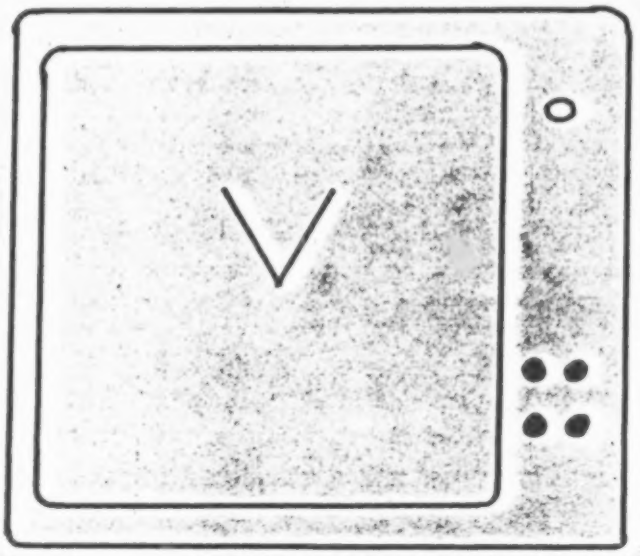
Back

C4



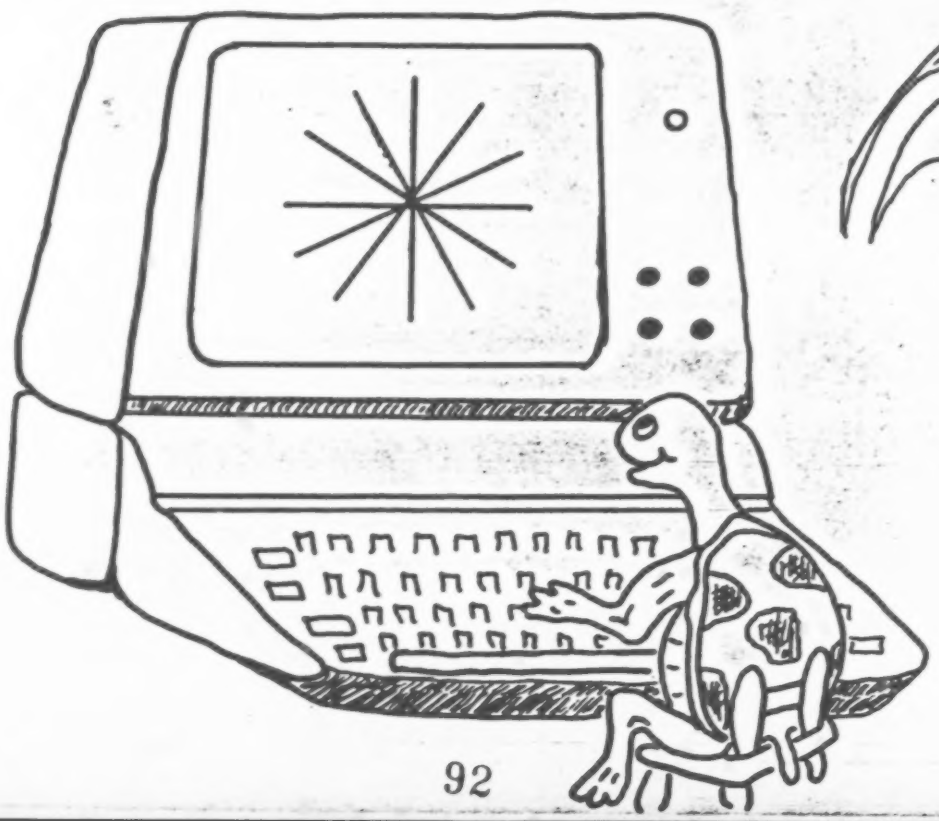
C5





C6

Do

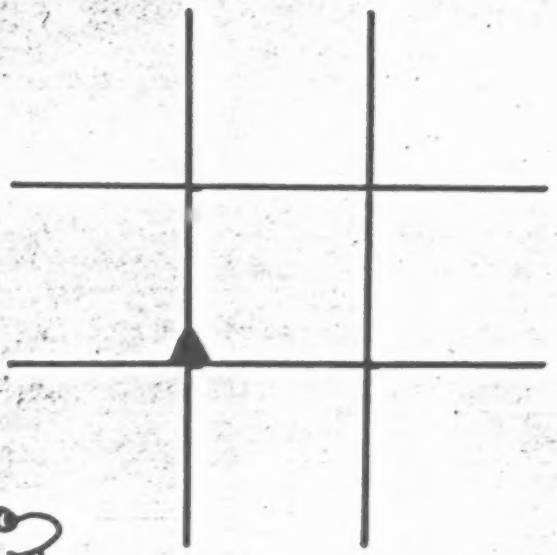


Do

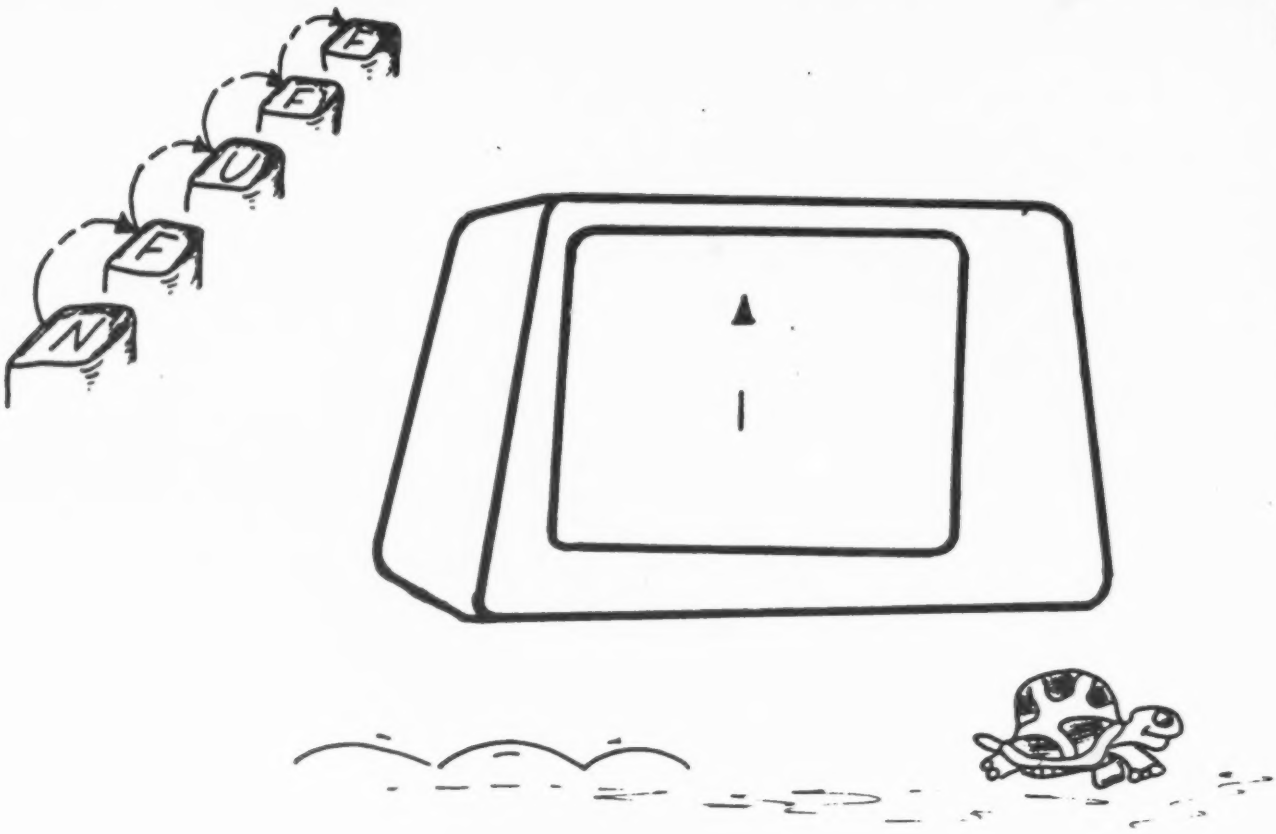
C7

Do

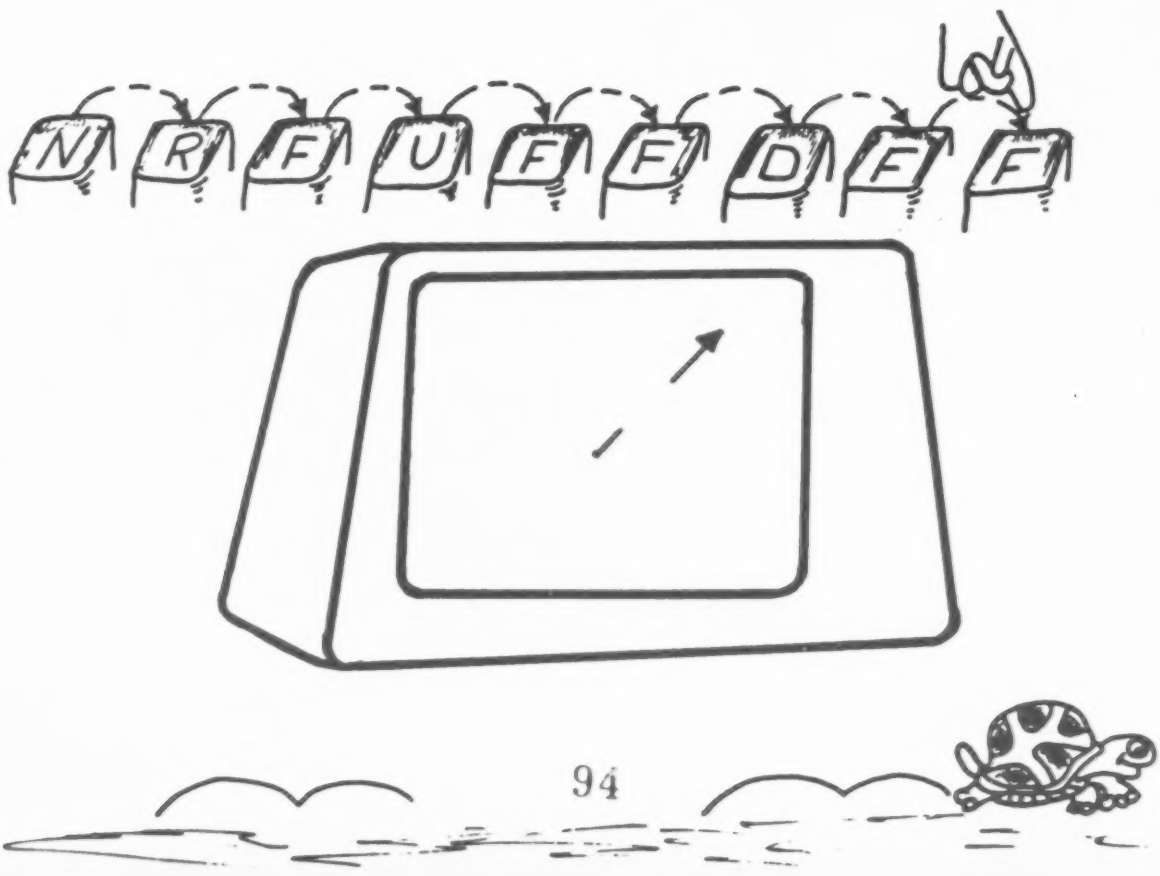
C8



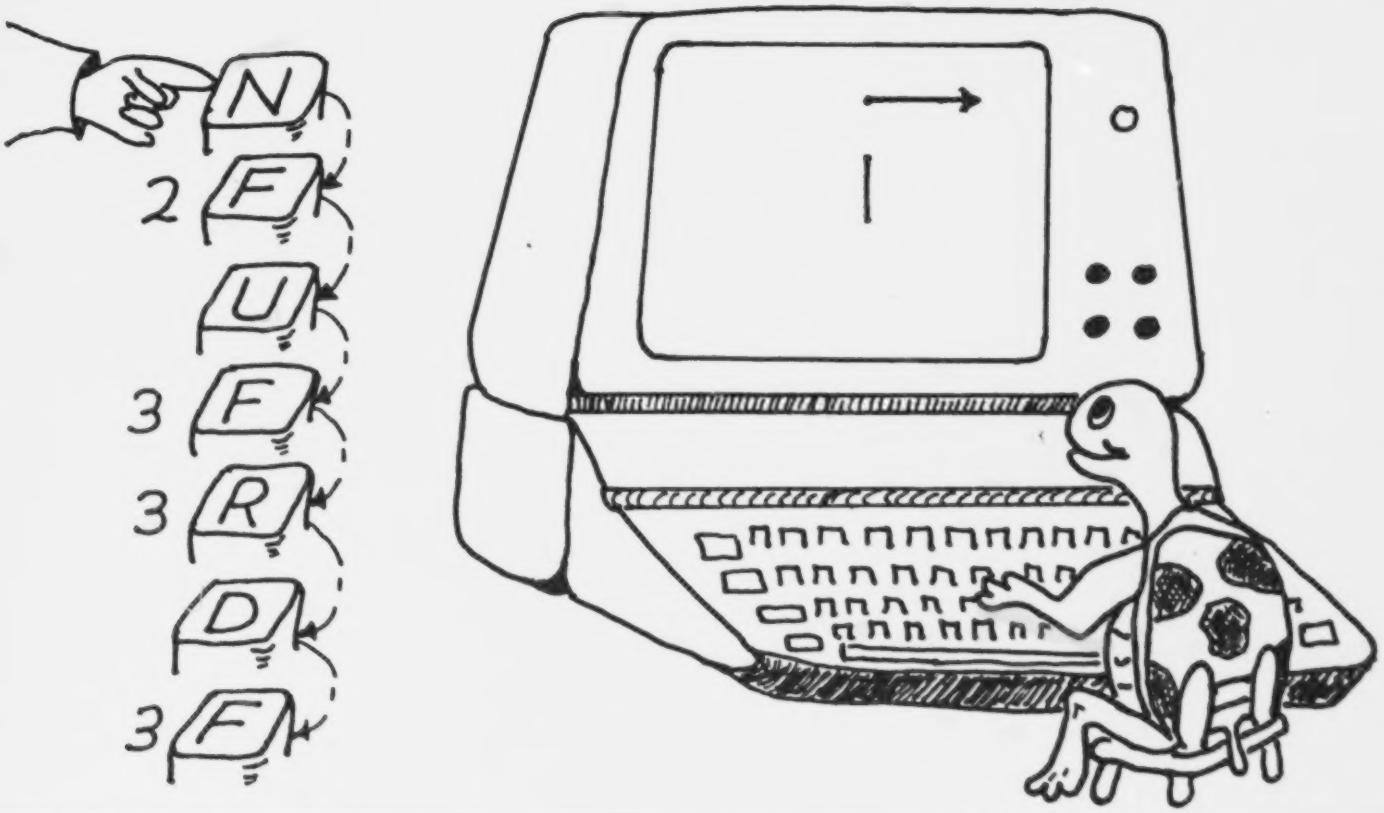
D1



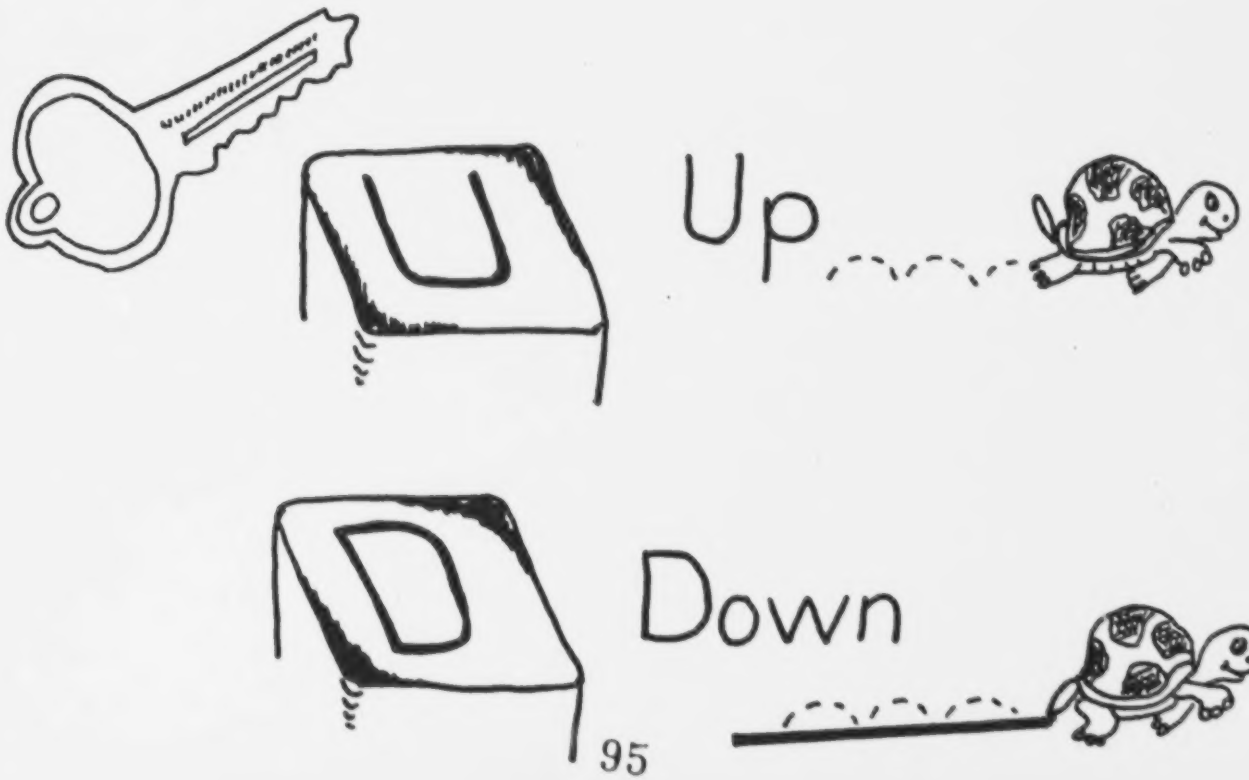
D2



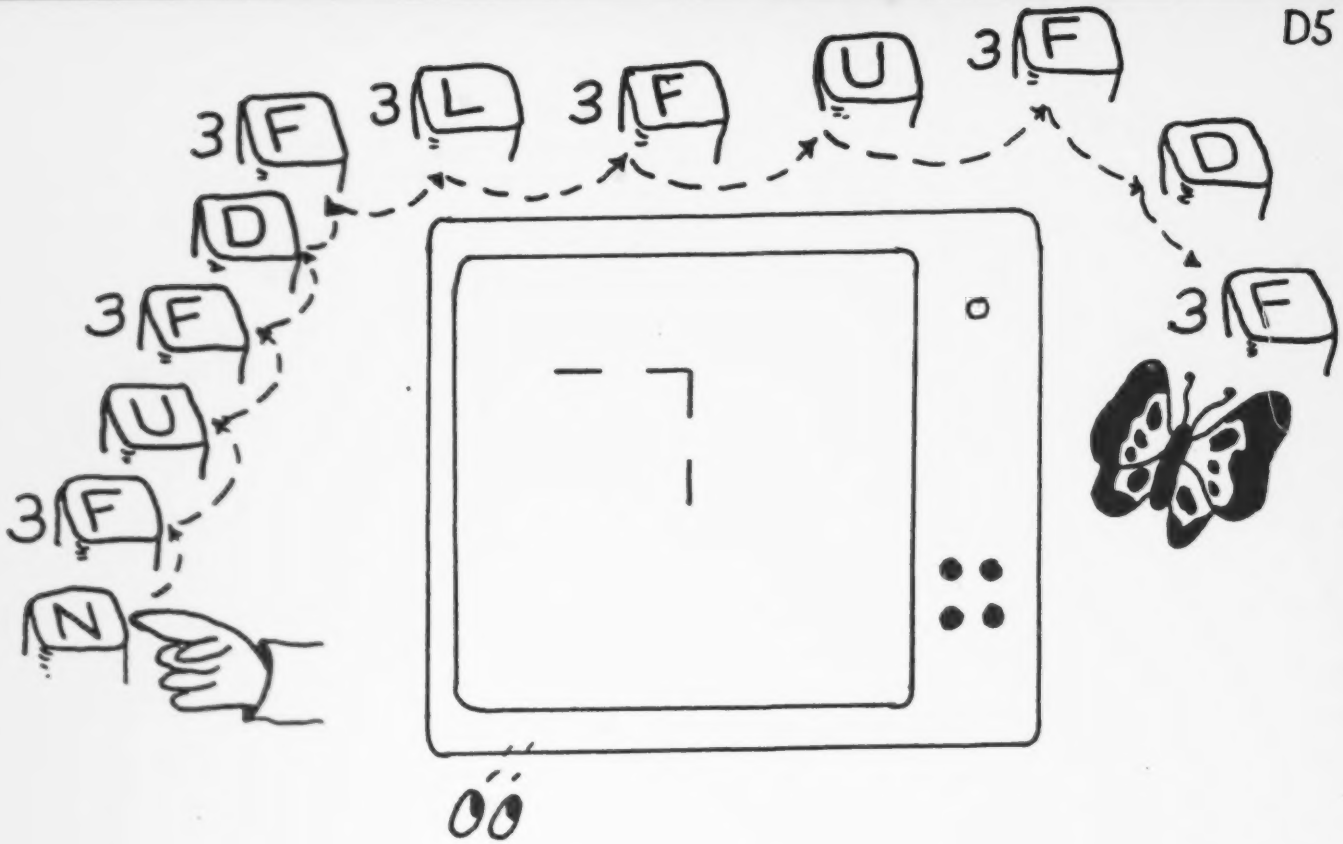
D3



D4

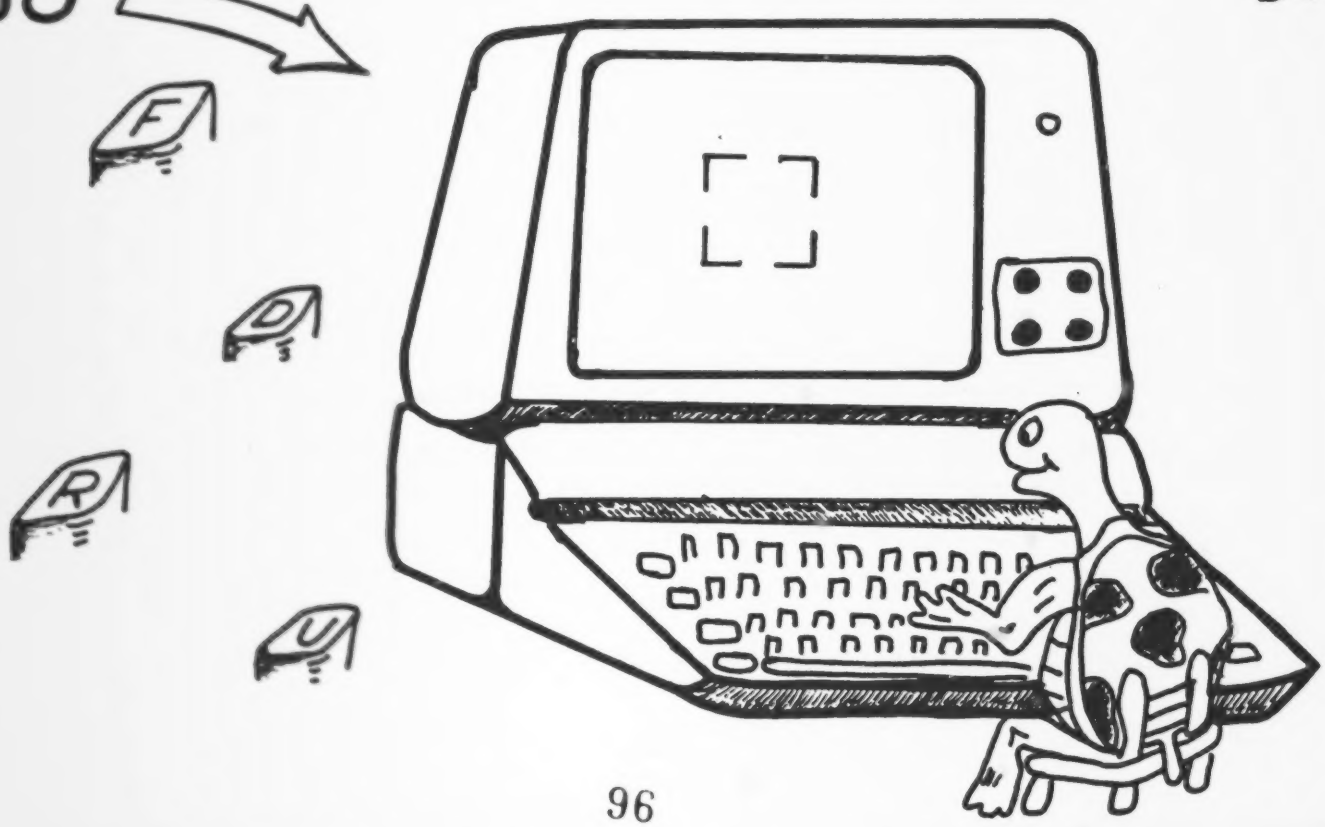


D5



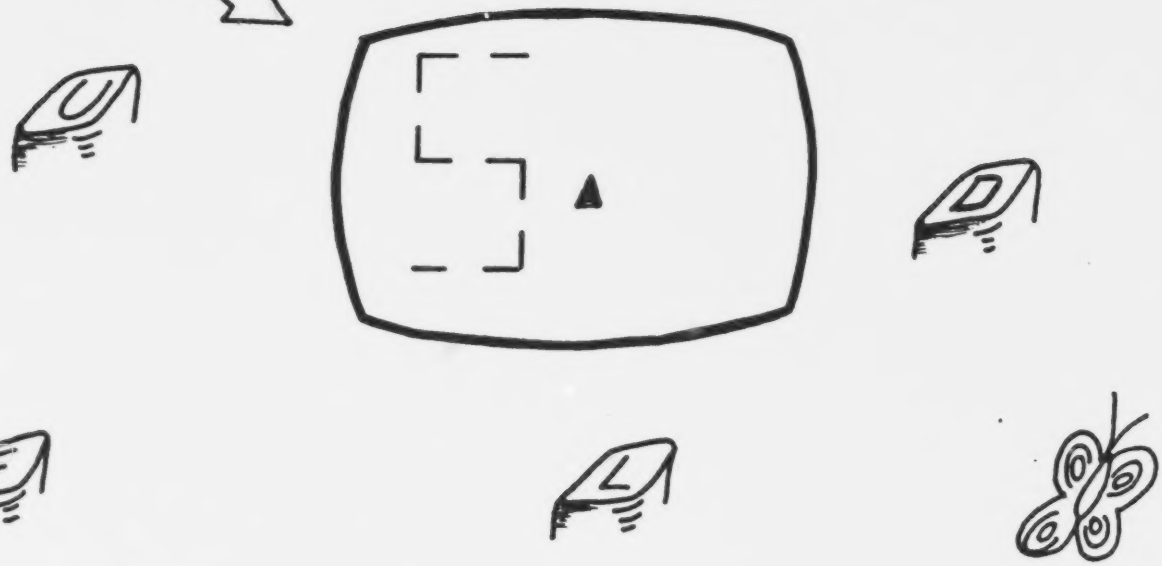
D6

DO

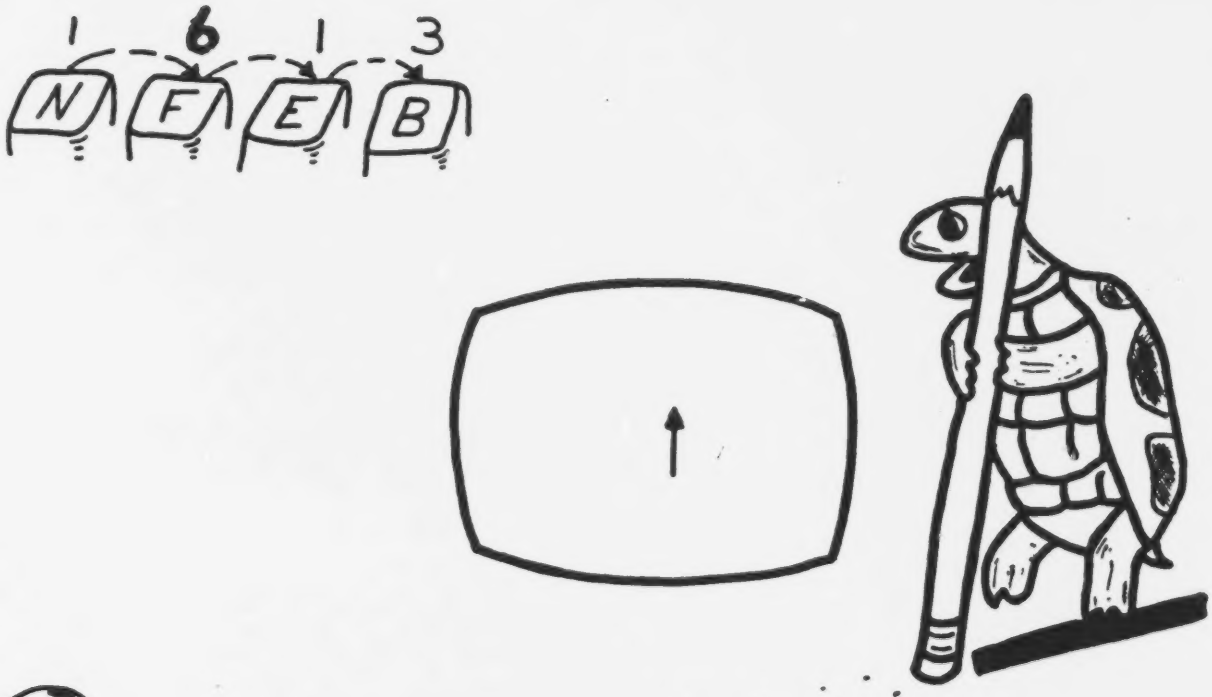


Do

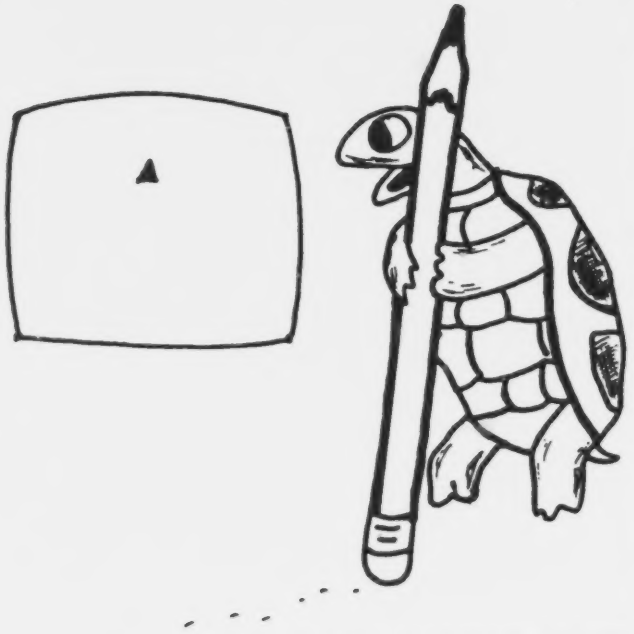
D7



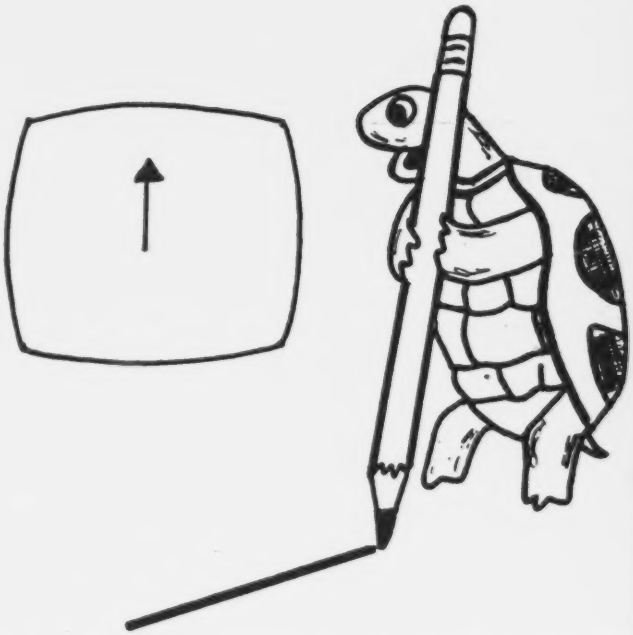
D8



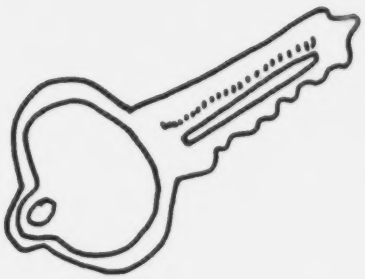
Go



D9

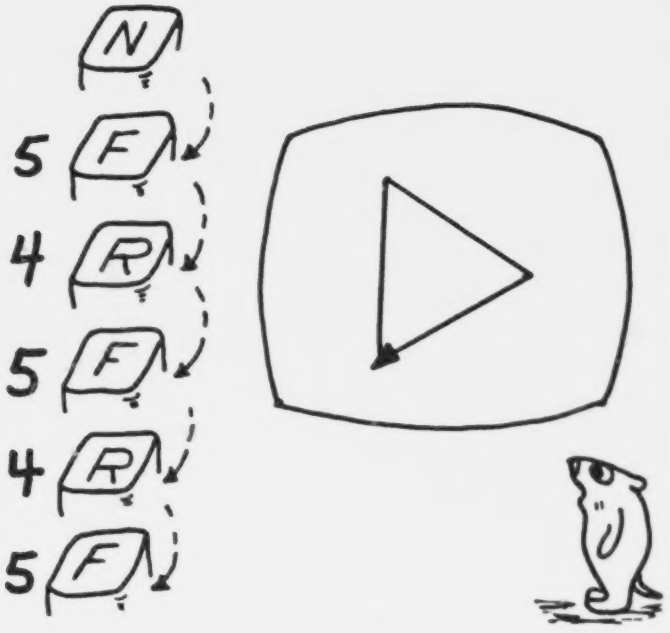


D10



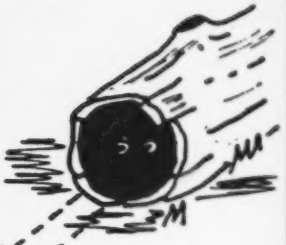
Eraser Down

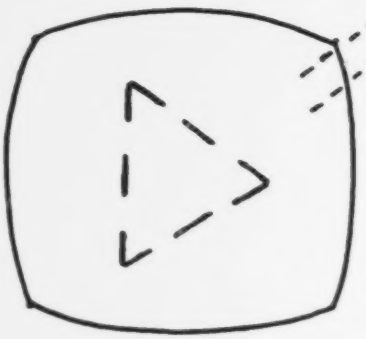
Pen Down

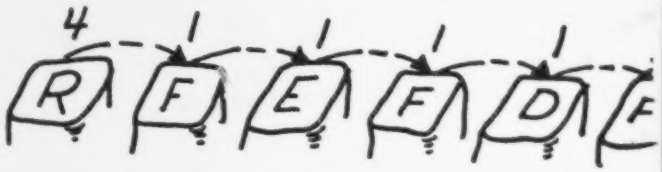


D0

D11

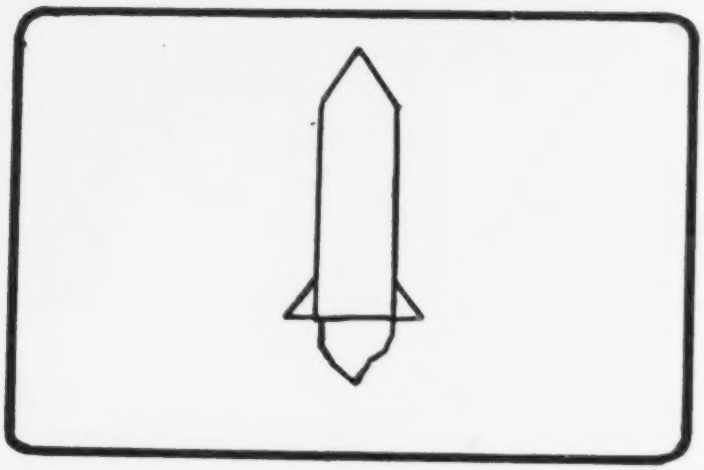


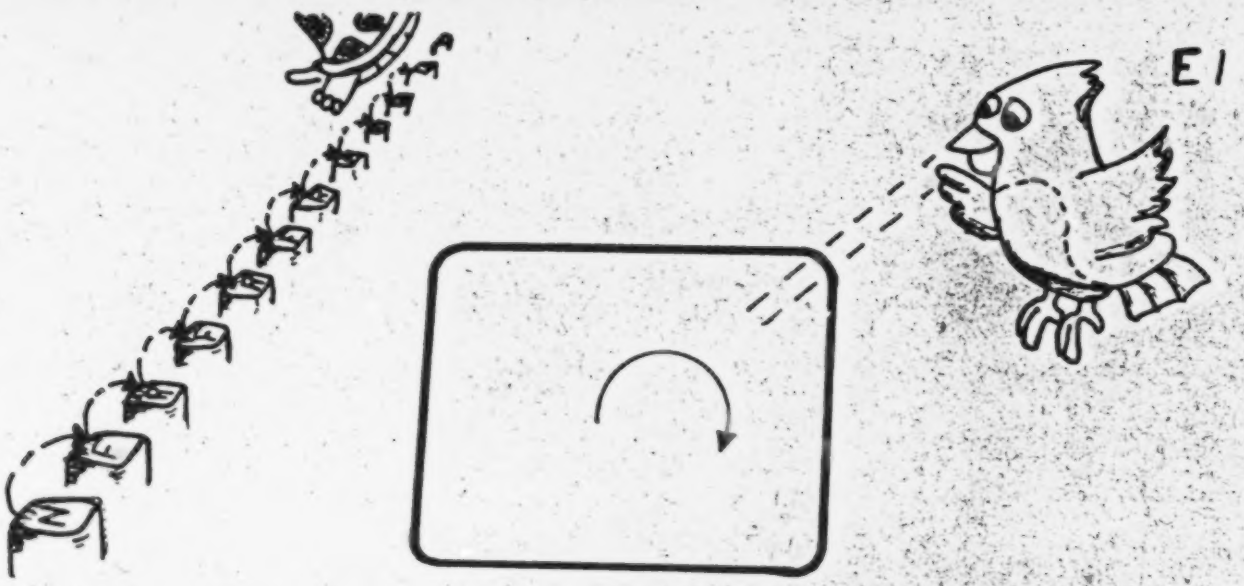




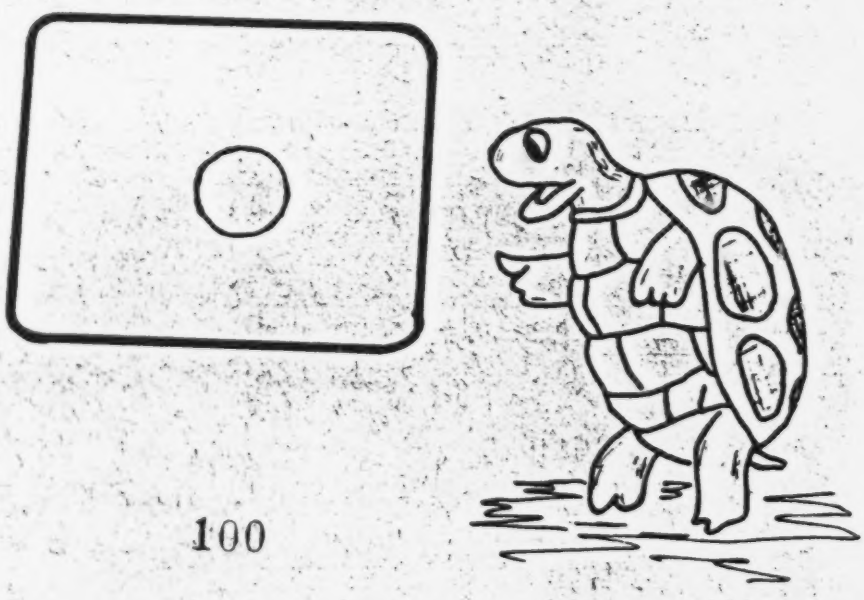
D0

D12

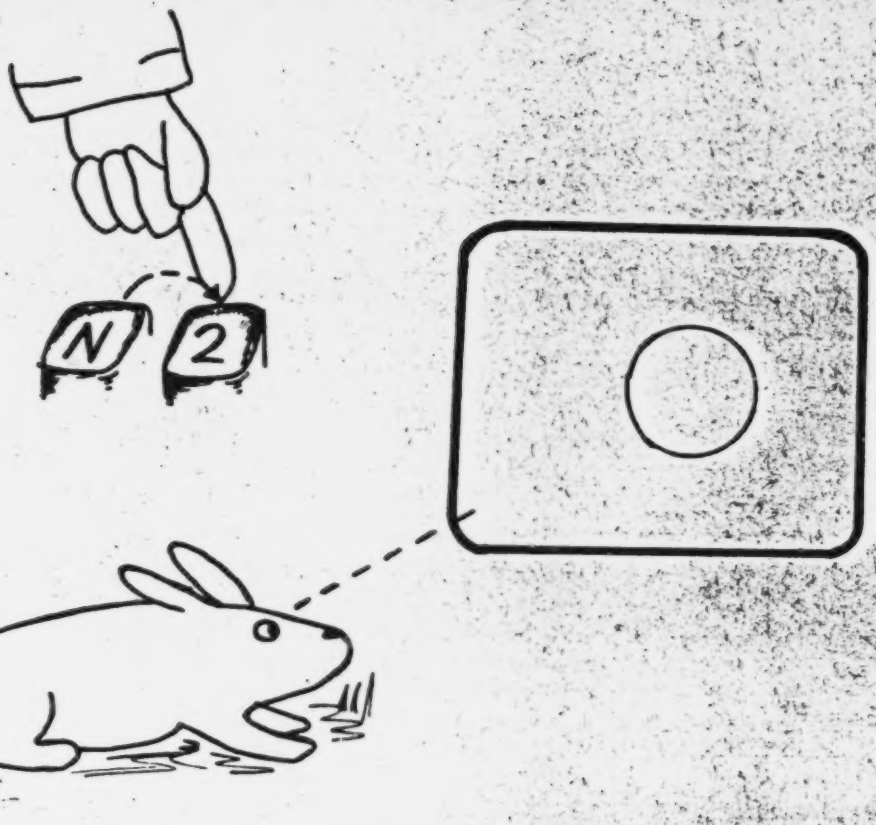




E2

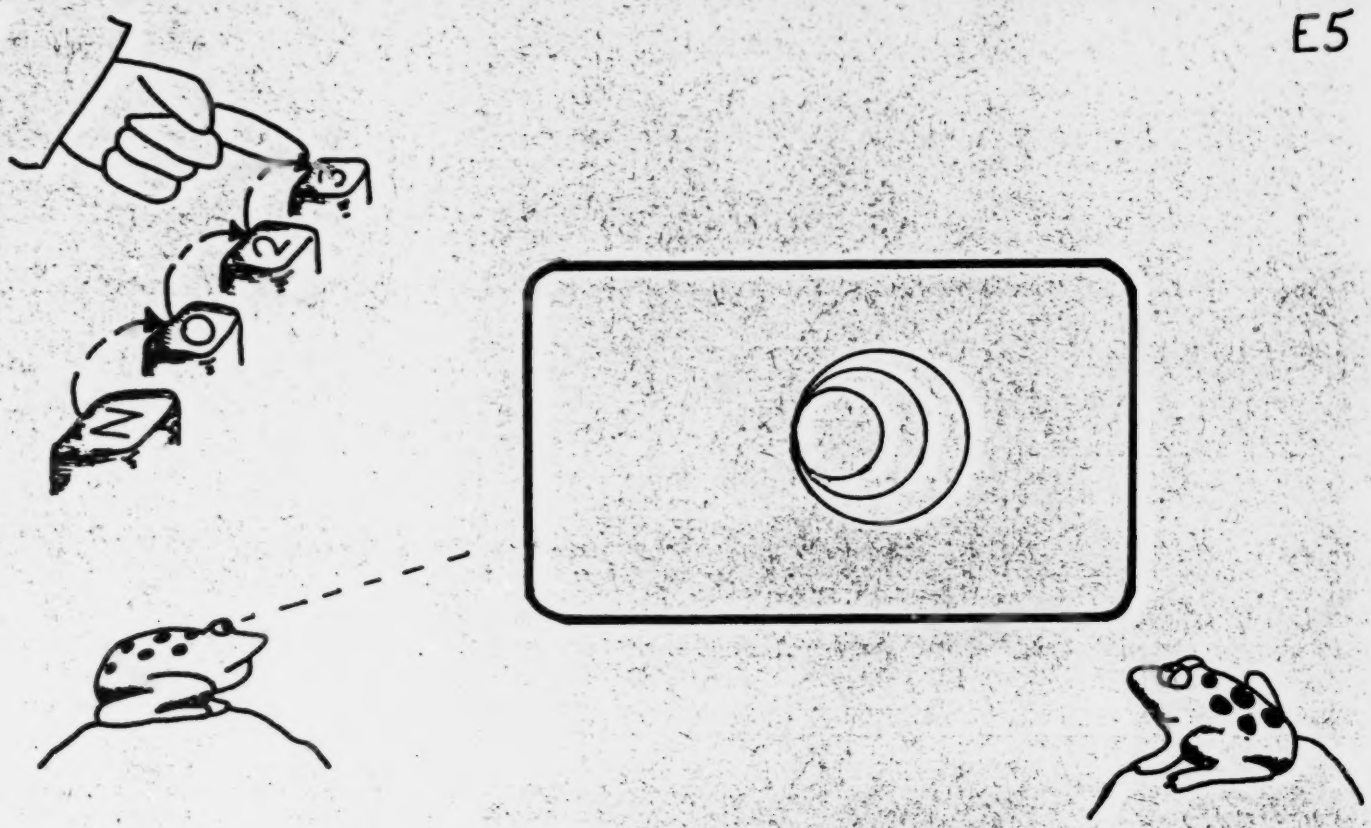


E3

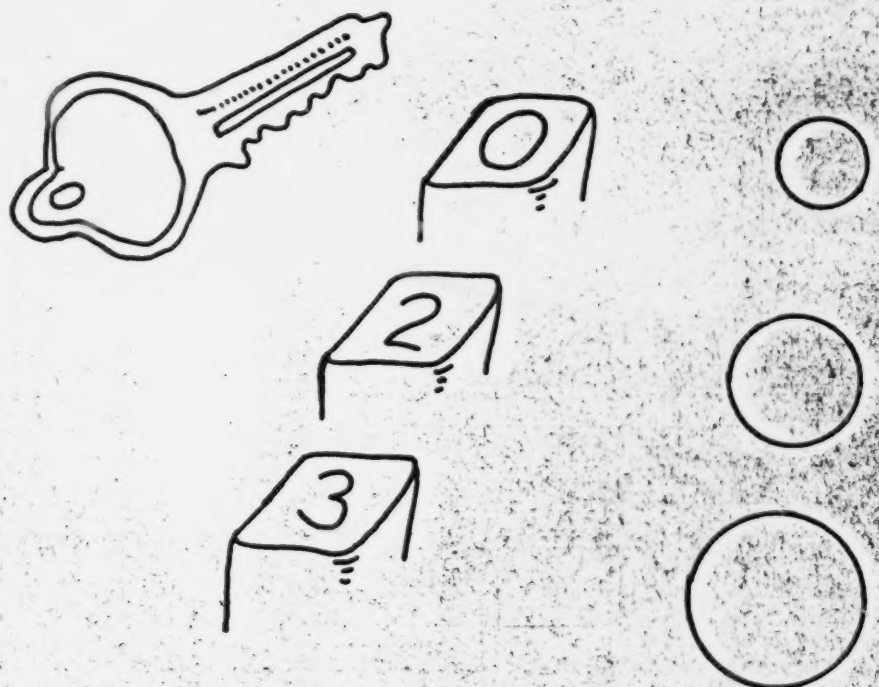


E4

E5

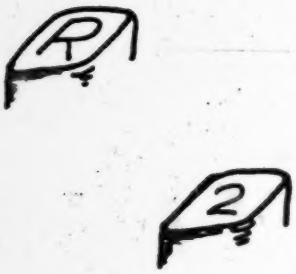


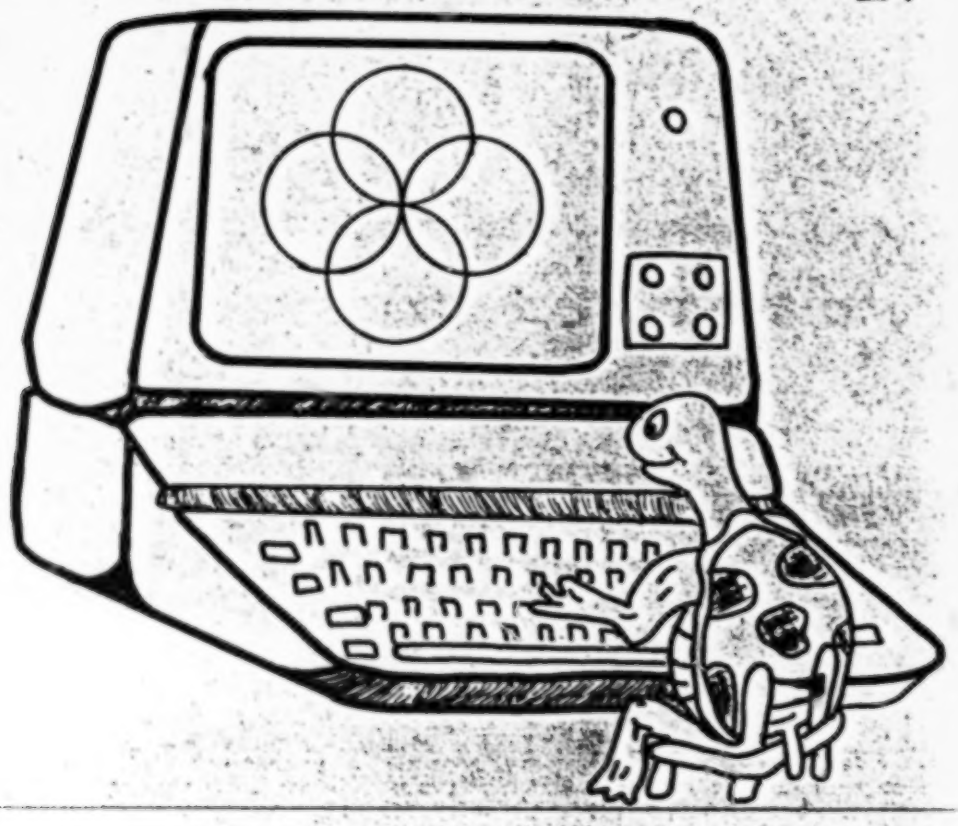
E6



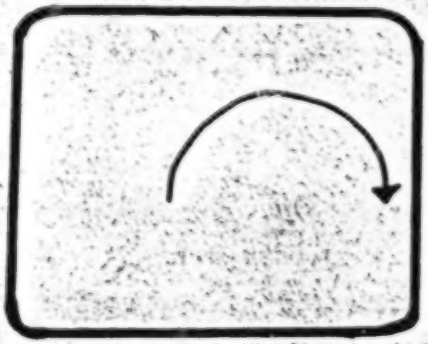
DO

E7

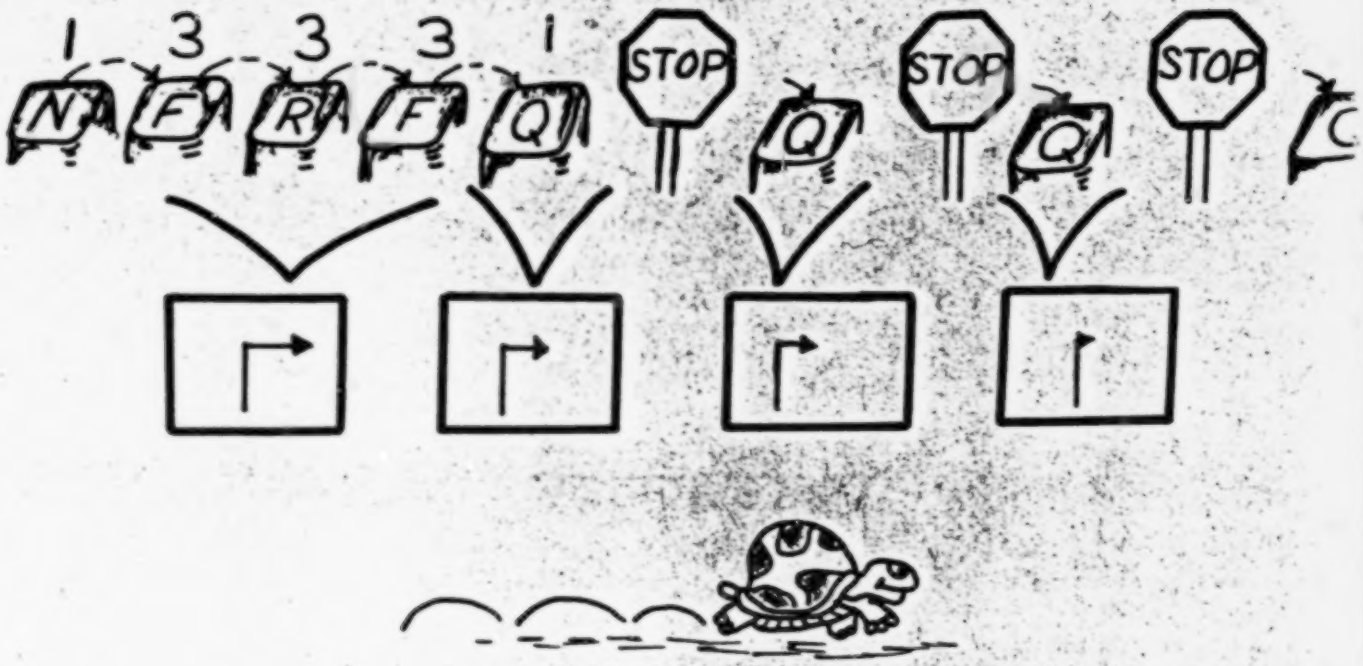




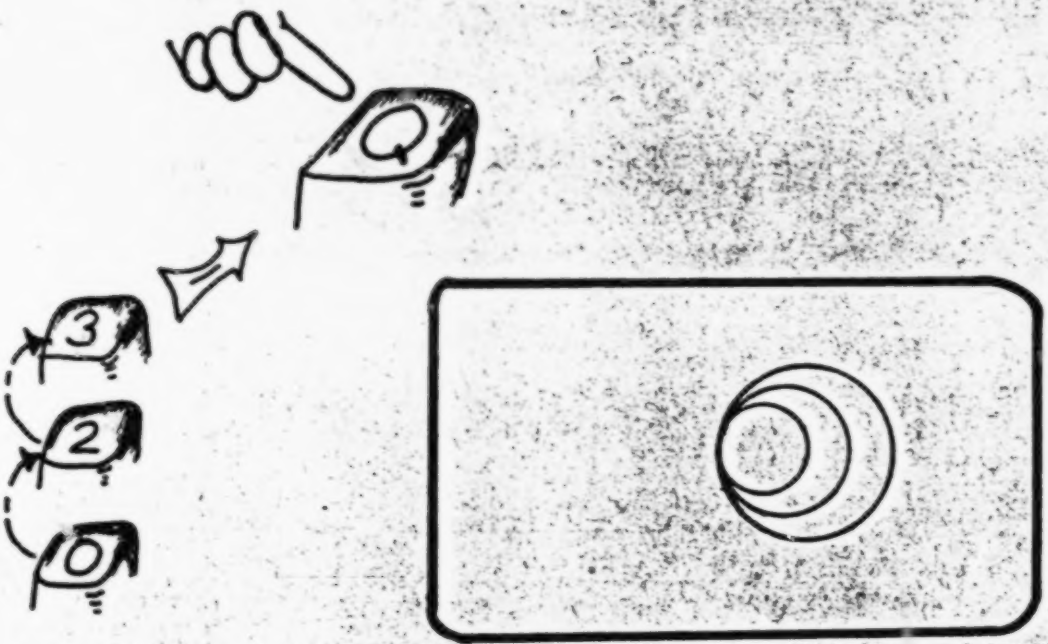
E8



E9

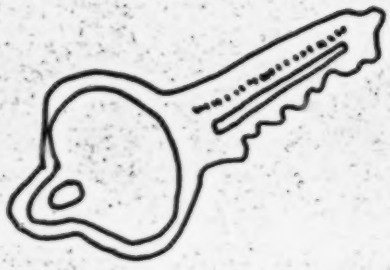


E10

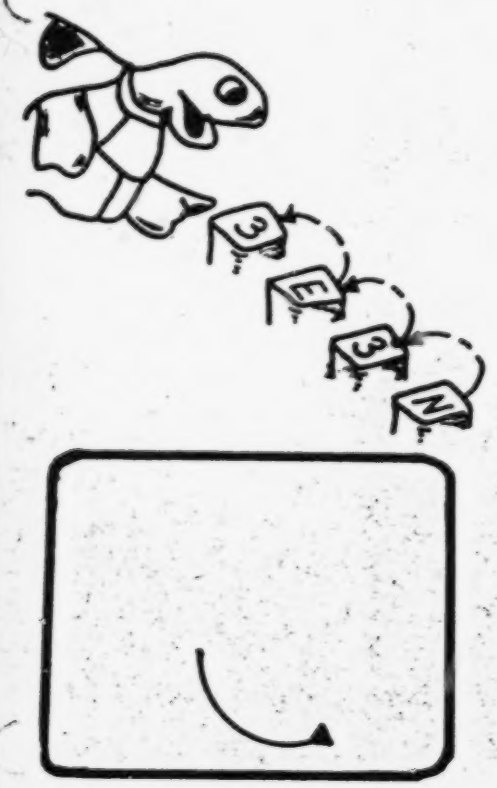


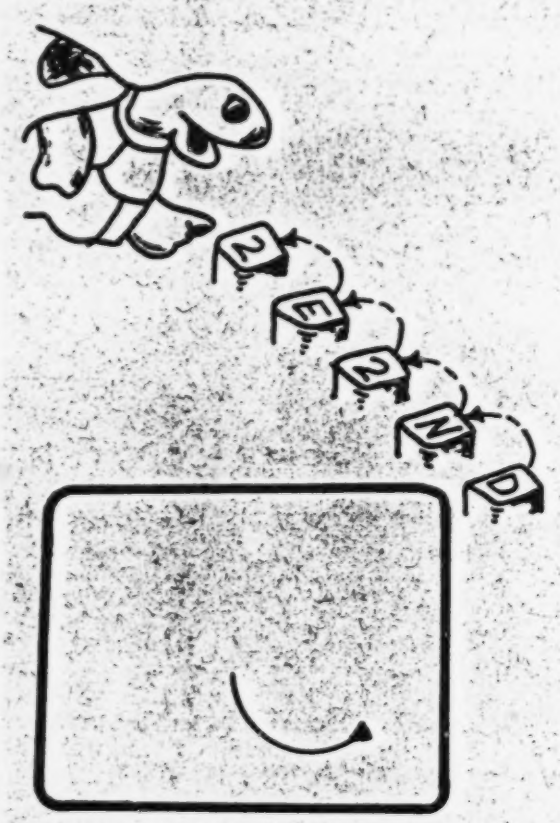
E11

UNDO

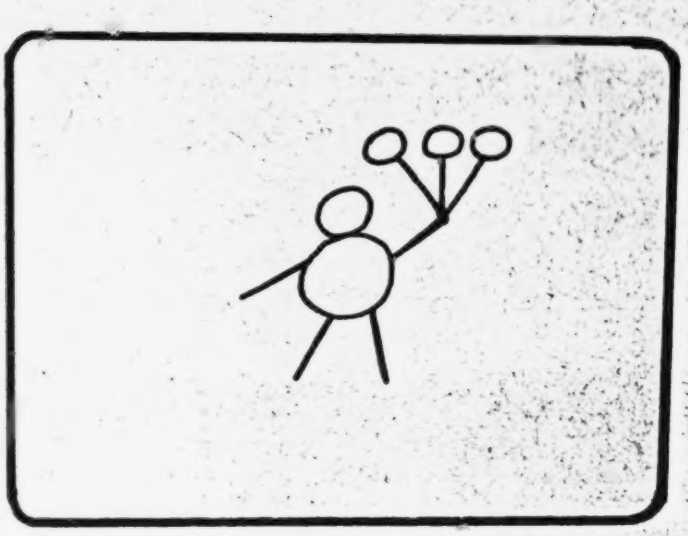


E12



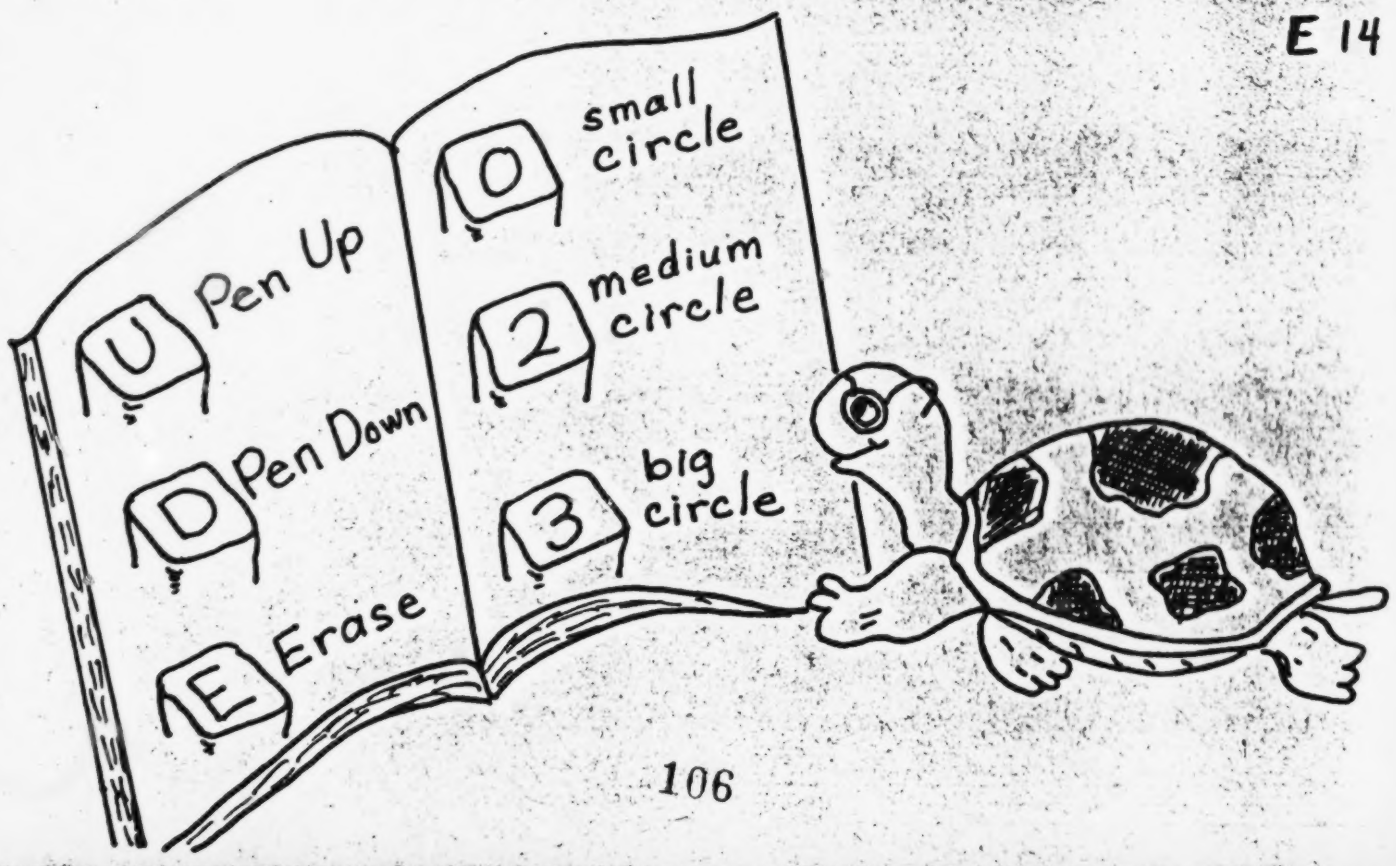


Do

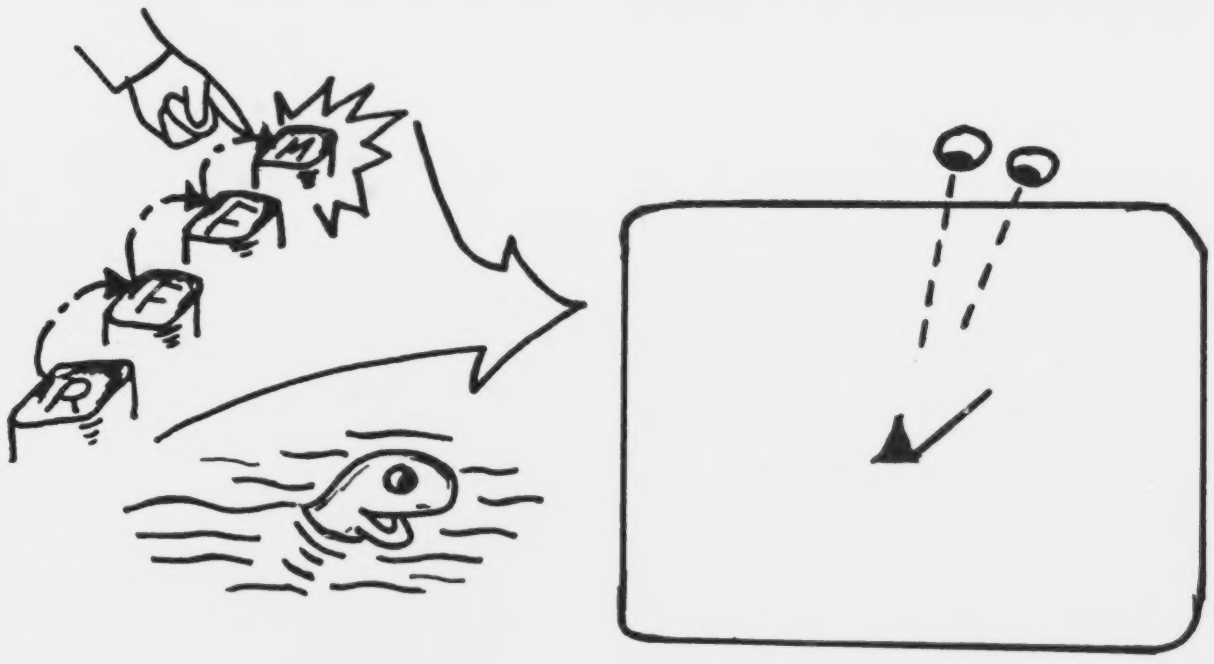


E13

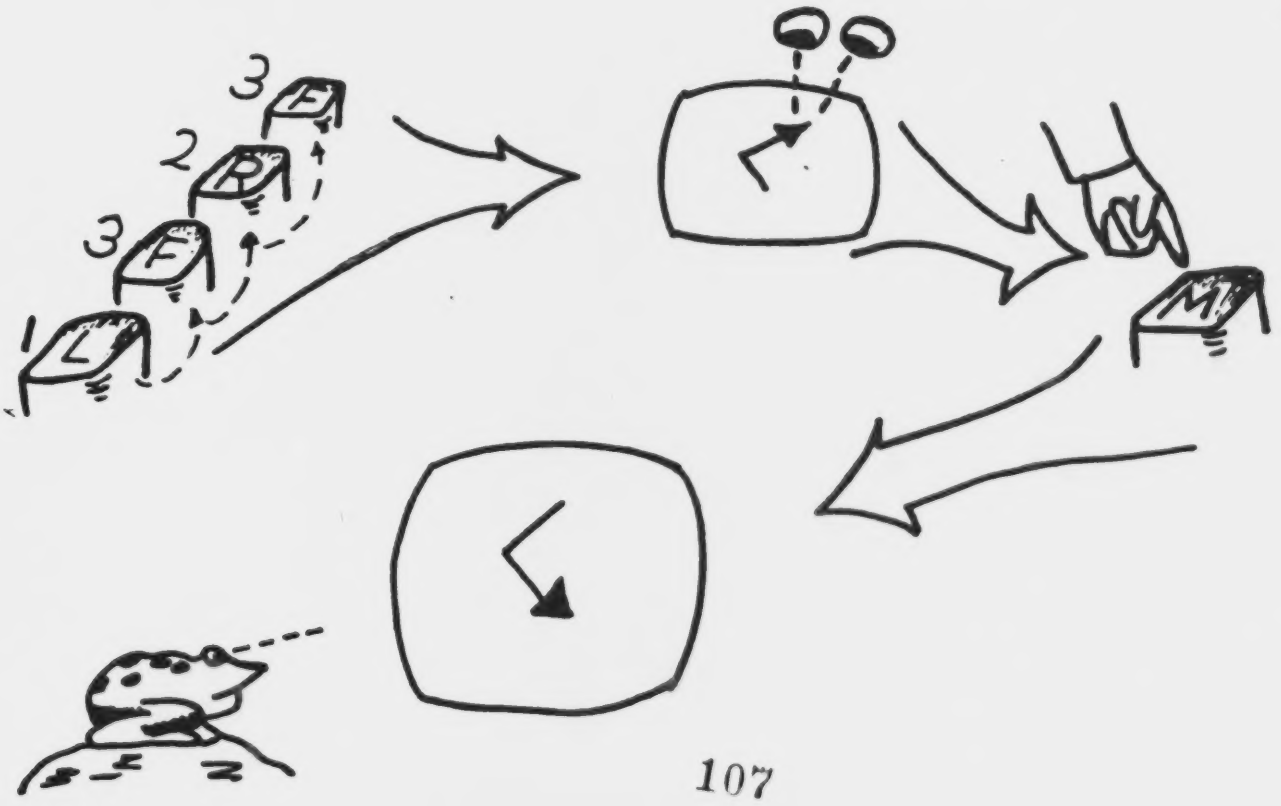
E14


U Pen Up
D Pen Down
E Erase
0 small circle
2 medium circle
3 big circle

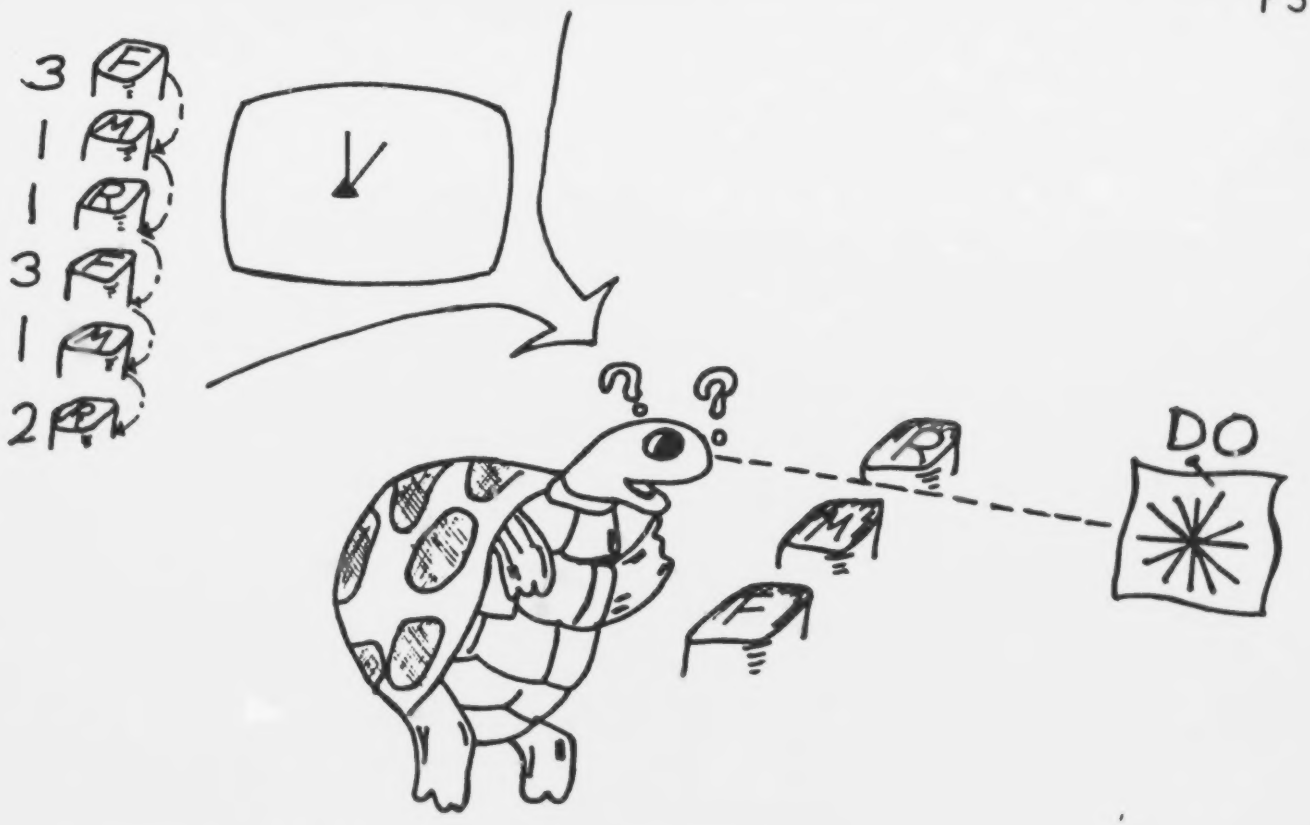
F1



F2

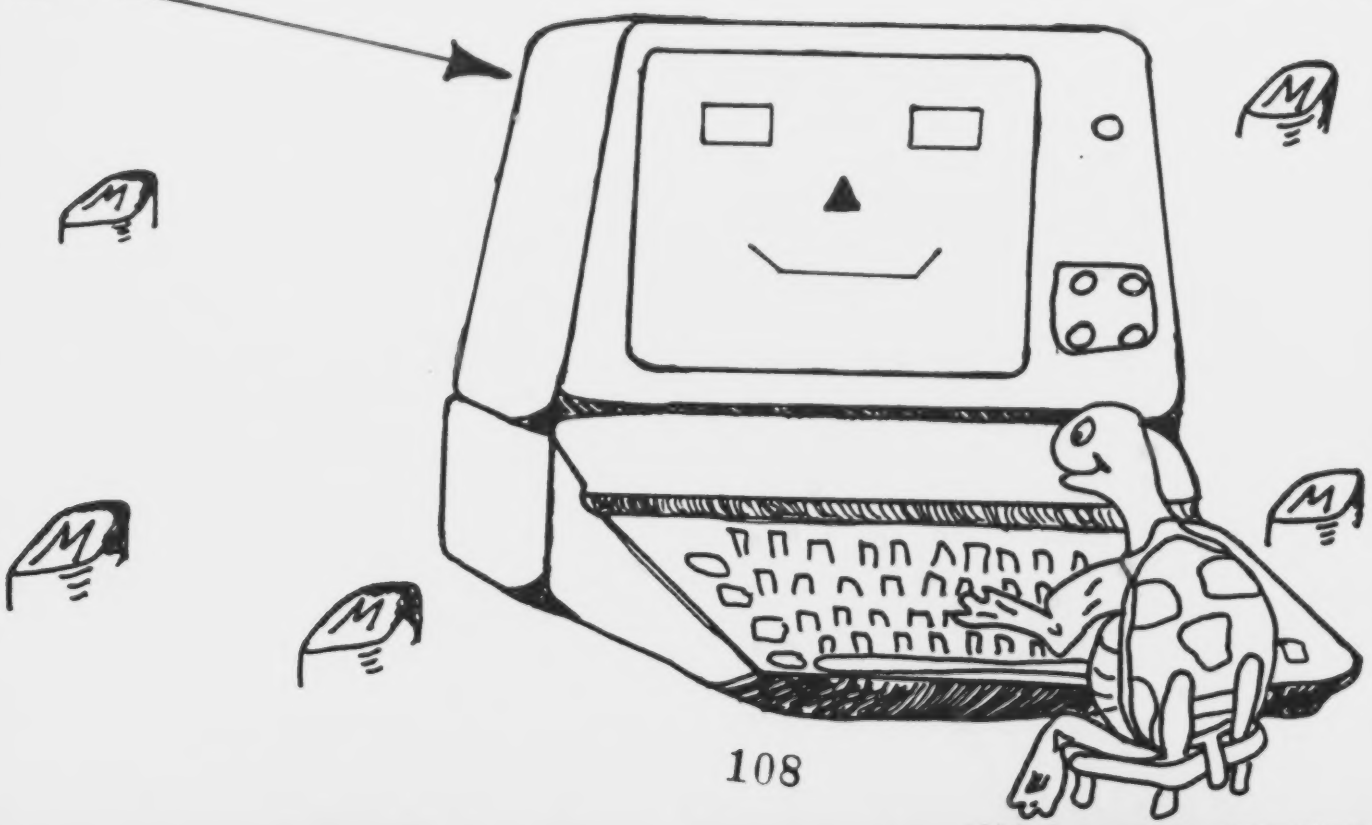


F3

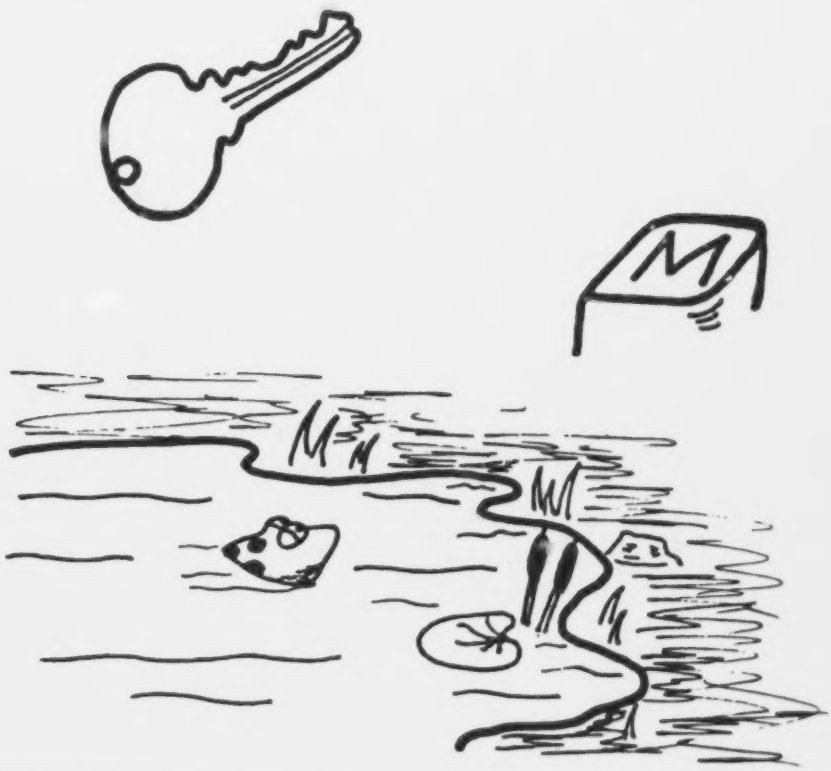


Do

F4

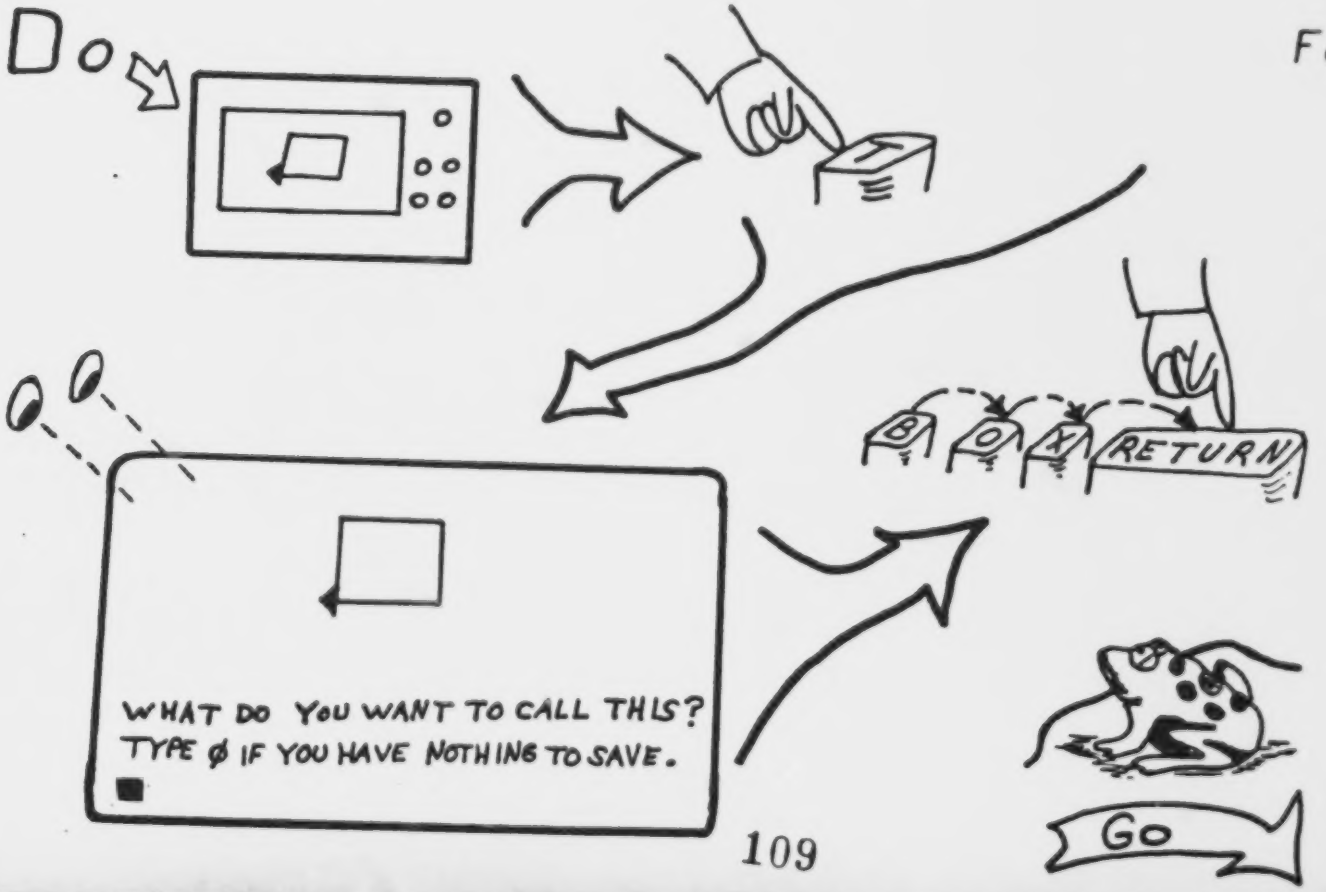


F5

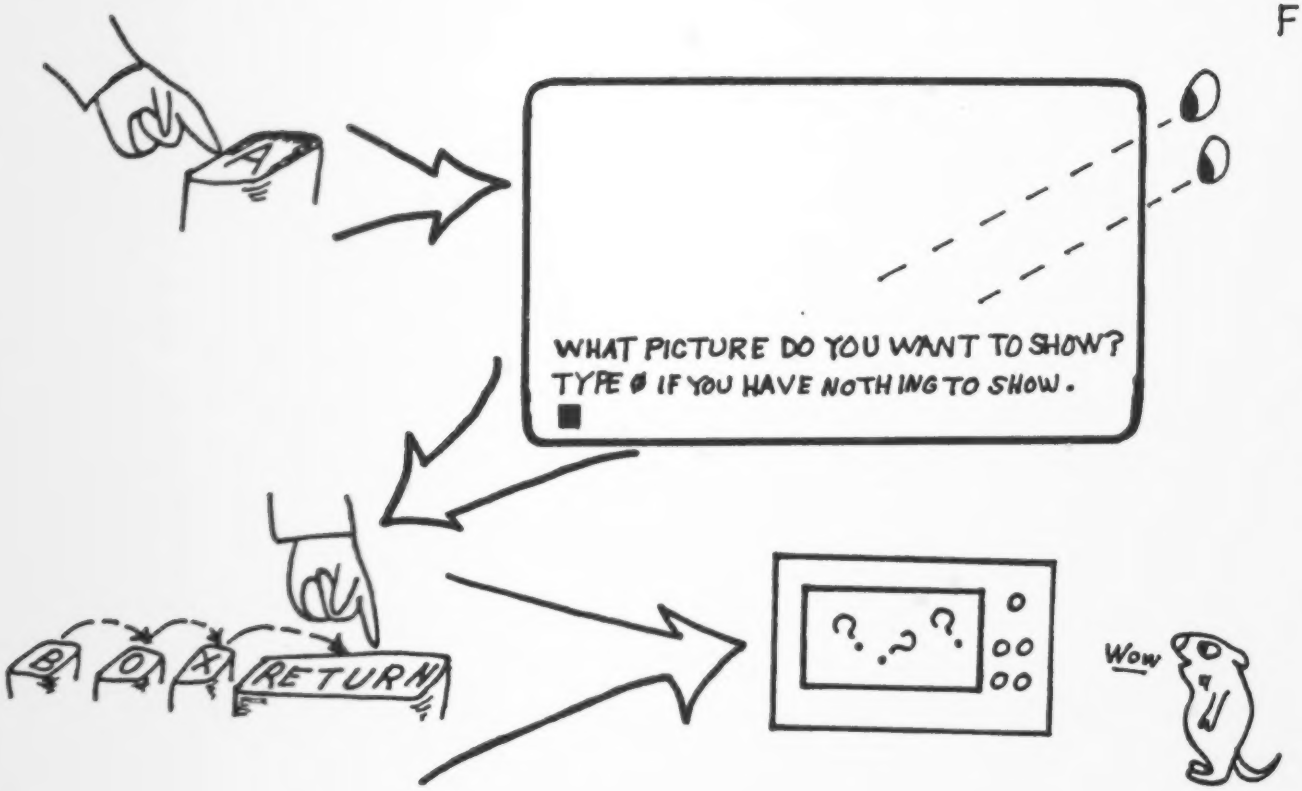


Move to Middle

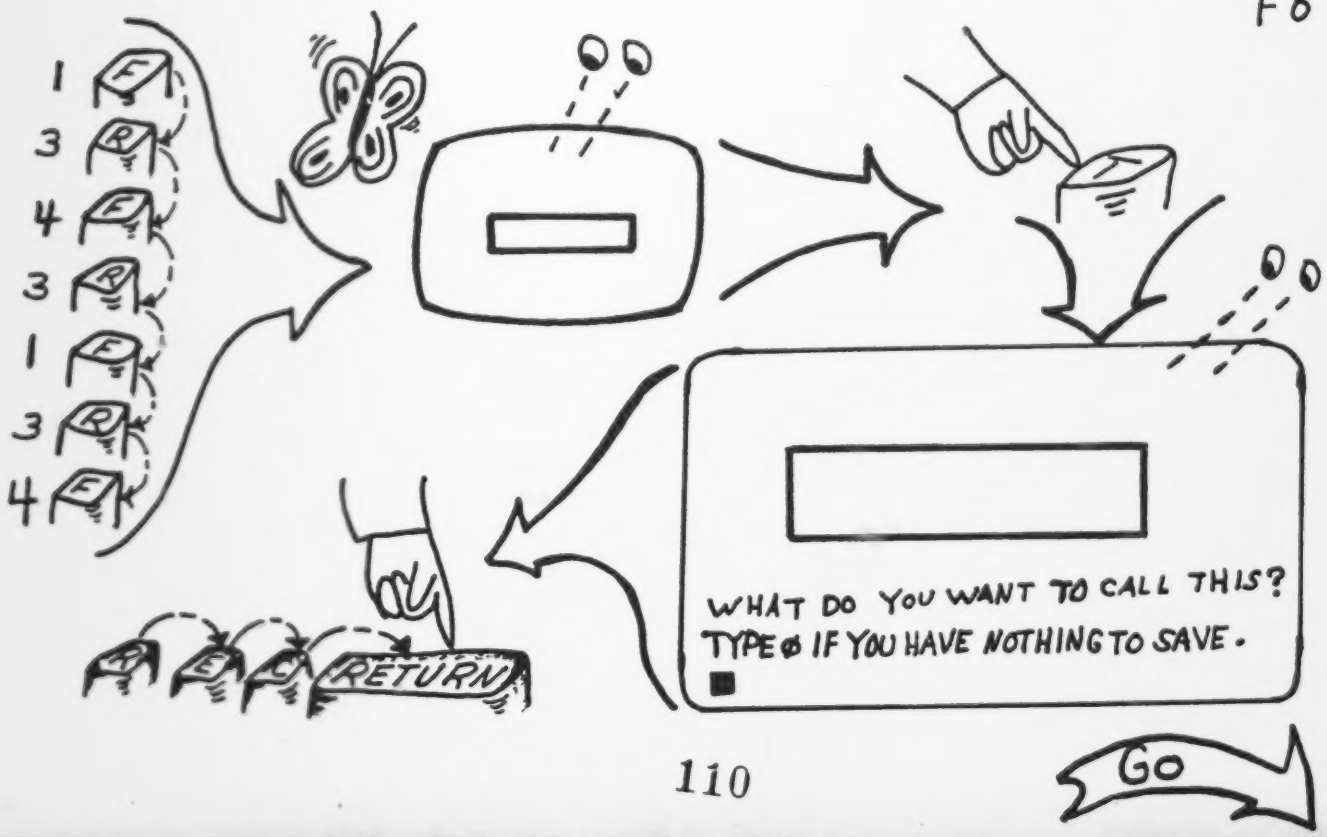
F6



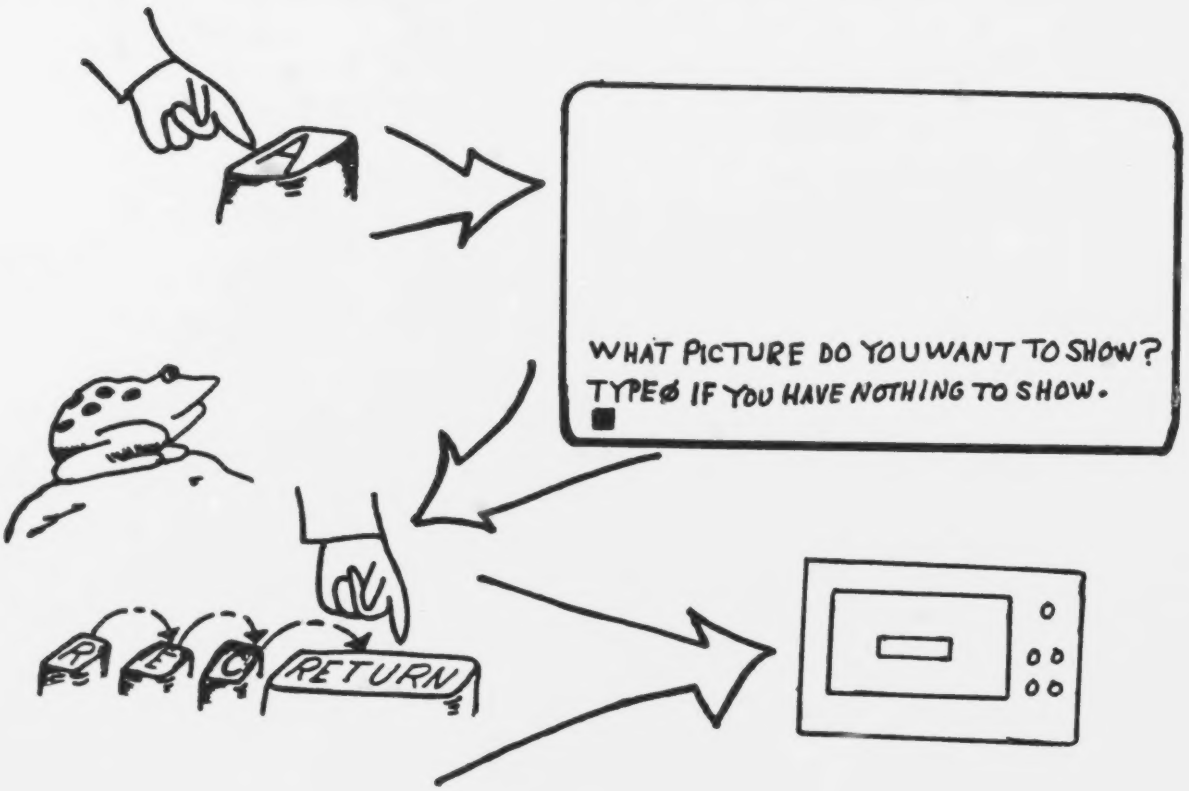
F7


A
WHAT PICTURE DO YOU WANT TO SHOW?
TYPE Ø IF YOU HAVE NOTHING TO SHOW.
B
O
X
RETURN
Wow

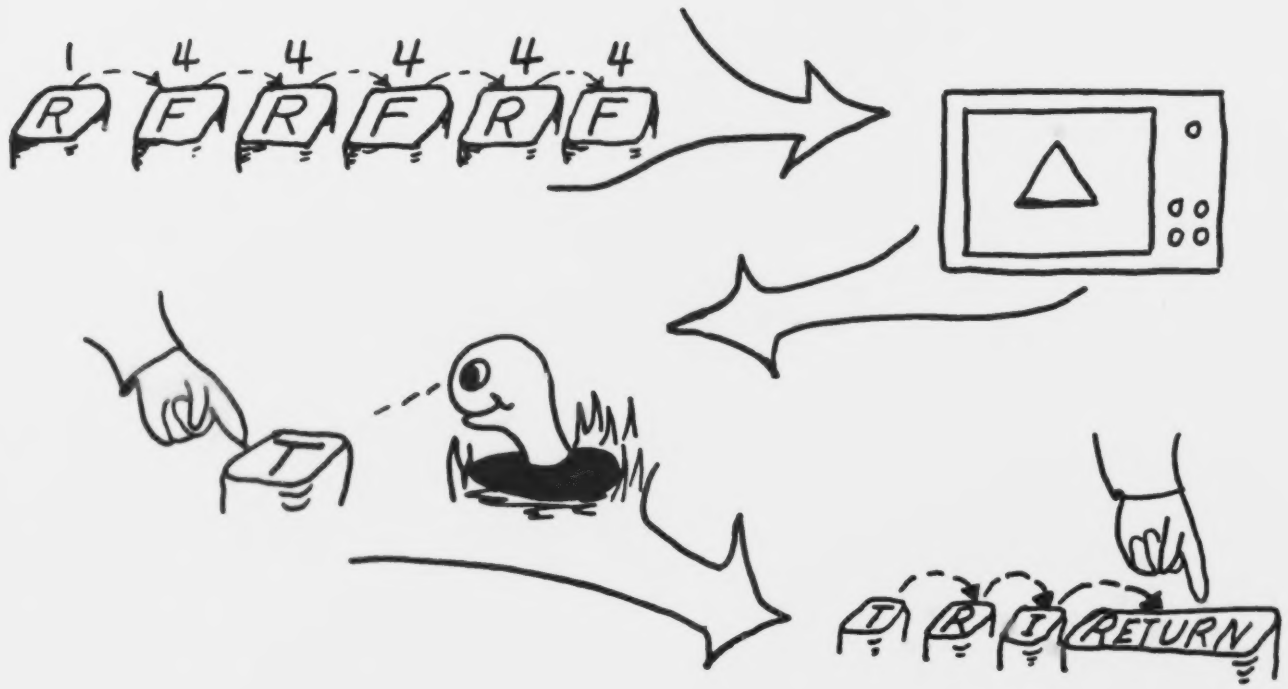
F8


1 F
3 R
4 E
3 R
1 F
3 R
4 E
WHAT DO YOU WANT TO CALL THIS?
TYPE Ø IF YOU HAVE NOTHING TO SAVE.
R
E
C
RETURN
GO

F9

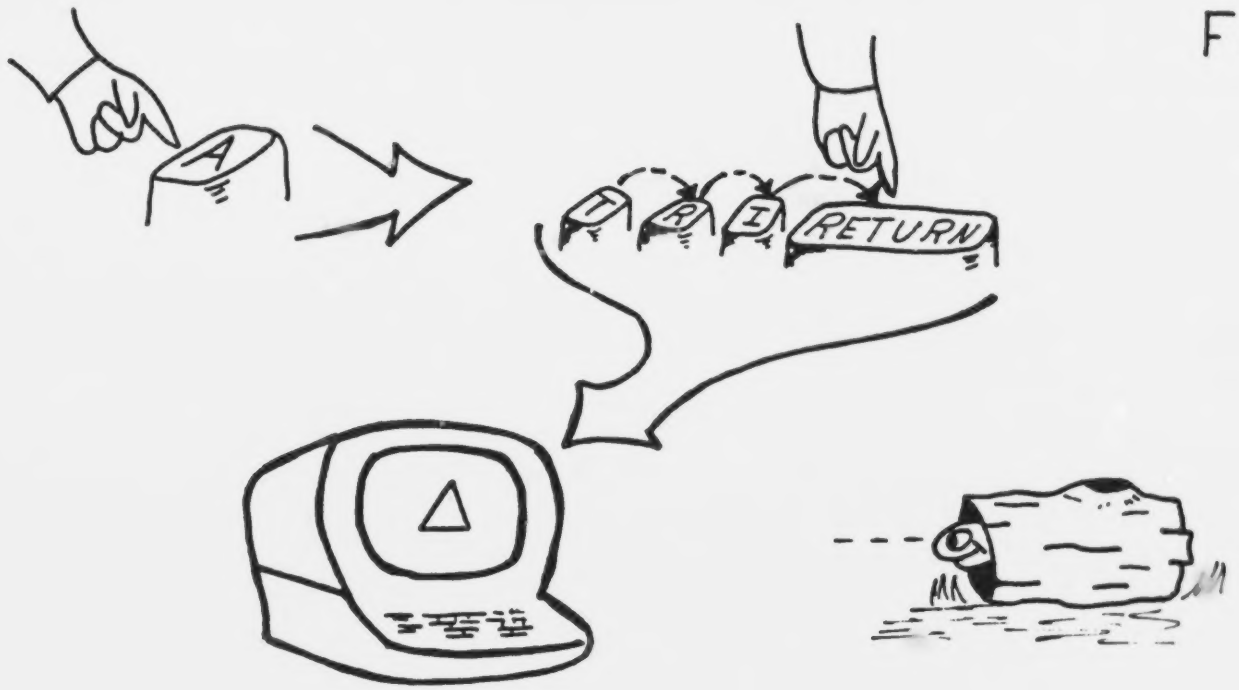

A
WHAT PICTURE DO YOU WANT TO SHOW?
TYPE Ø IF YOU HAVE NOTHING TO SHOW.
RETURN

F10

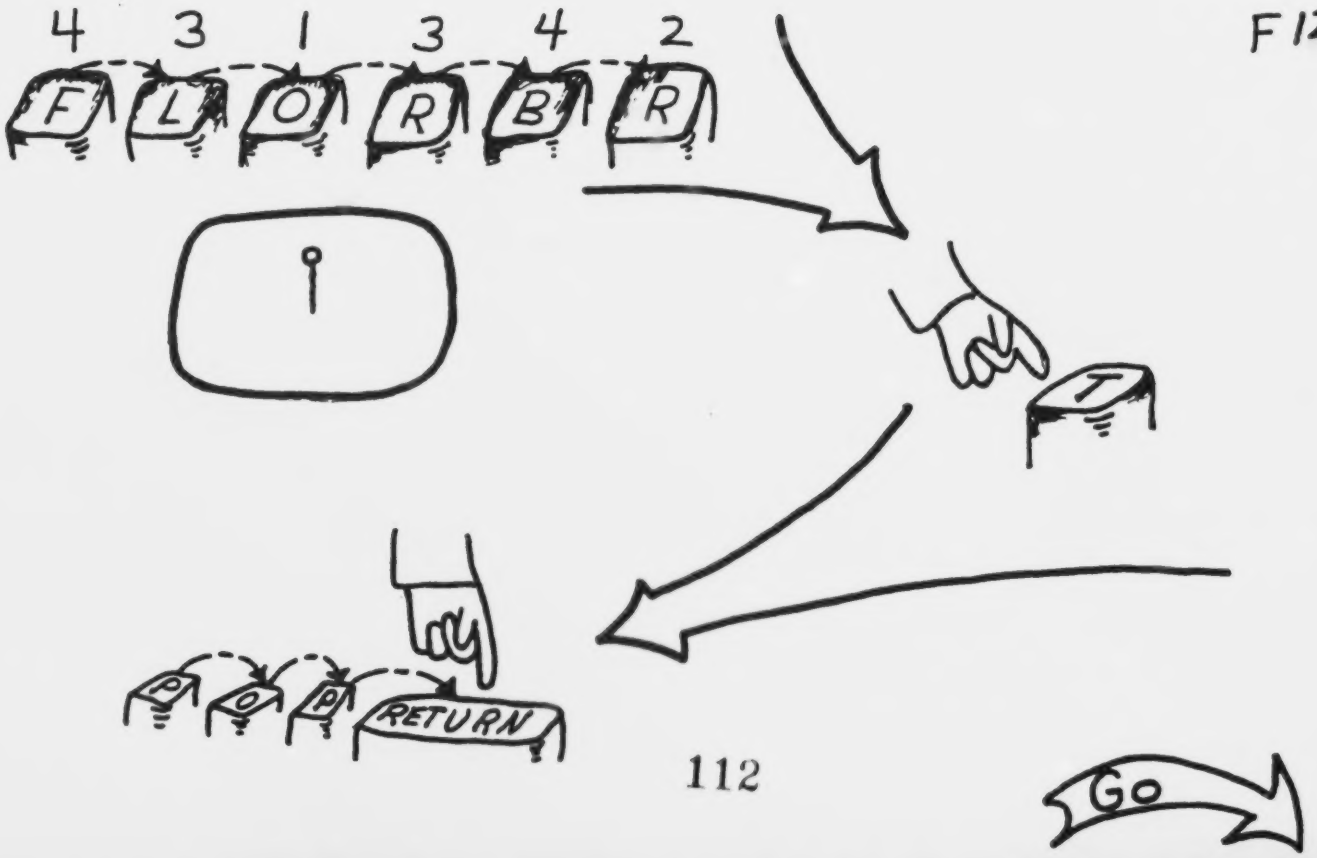

1
4
4
4
4
4
R
F
R
F
R
F
T
I
R
I
RETURN

Go

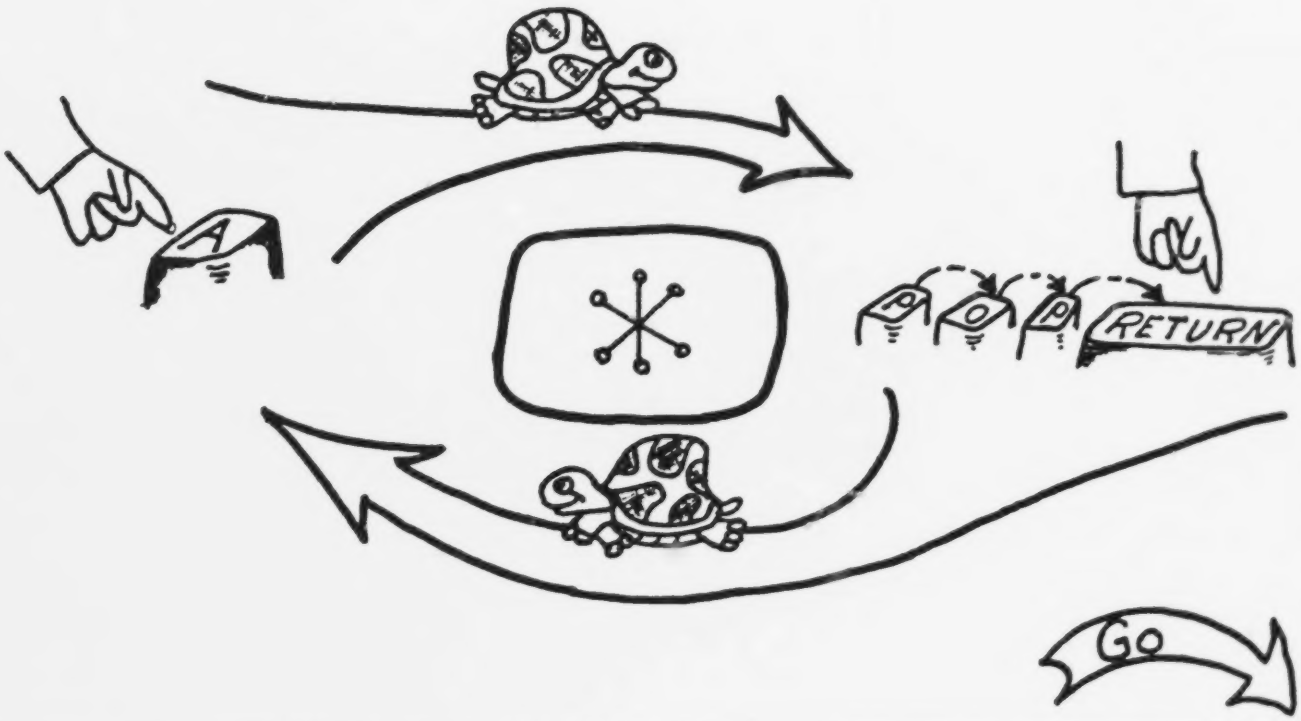
F11



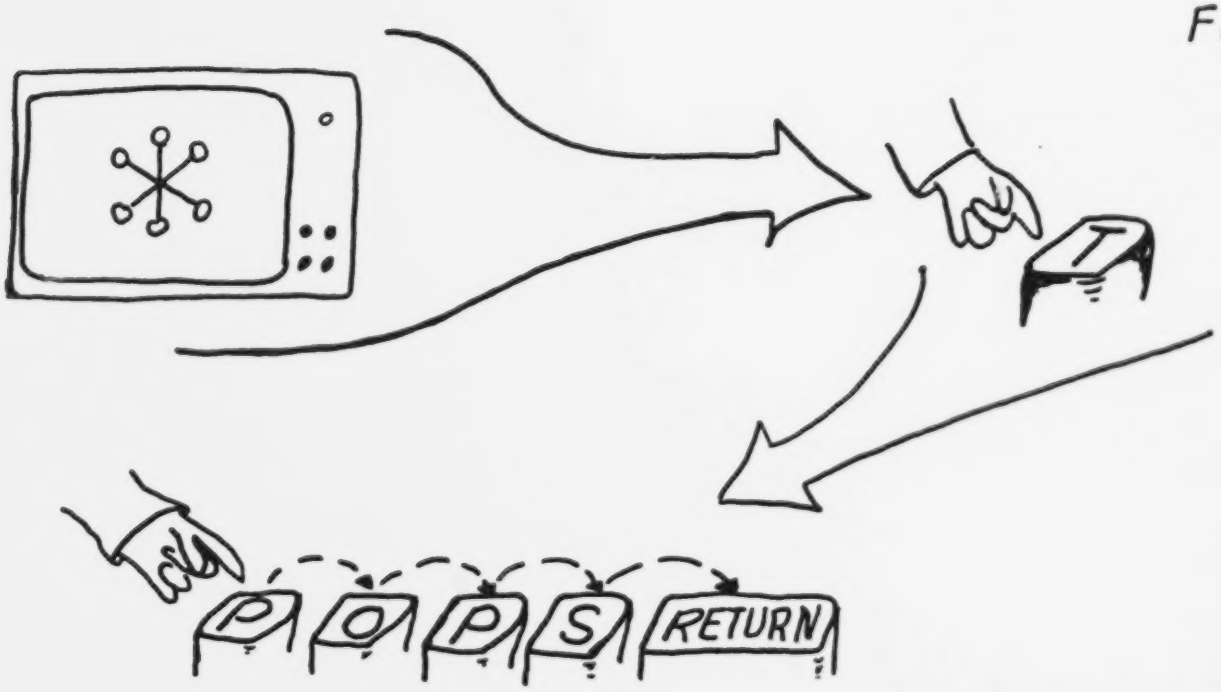
F12



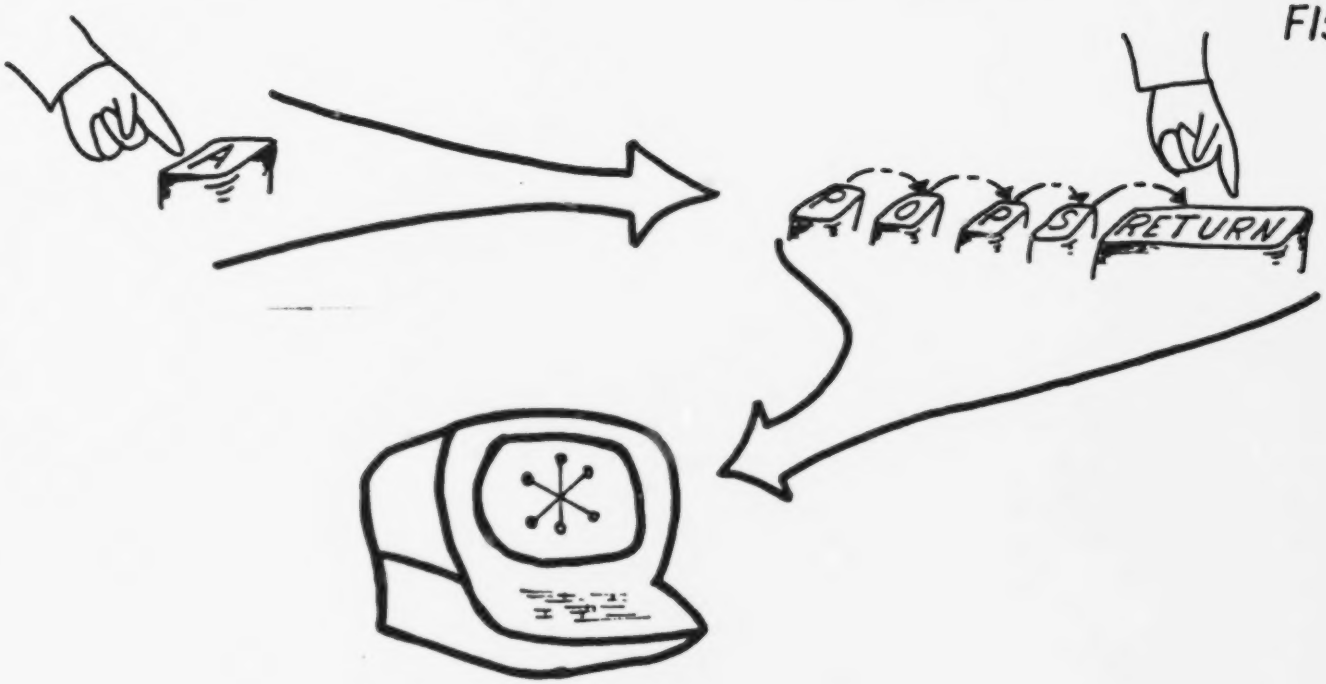
F13



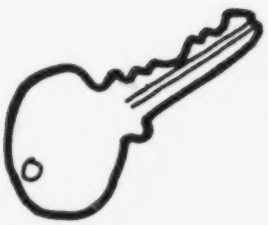
F14



F15



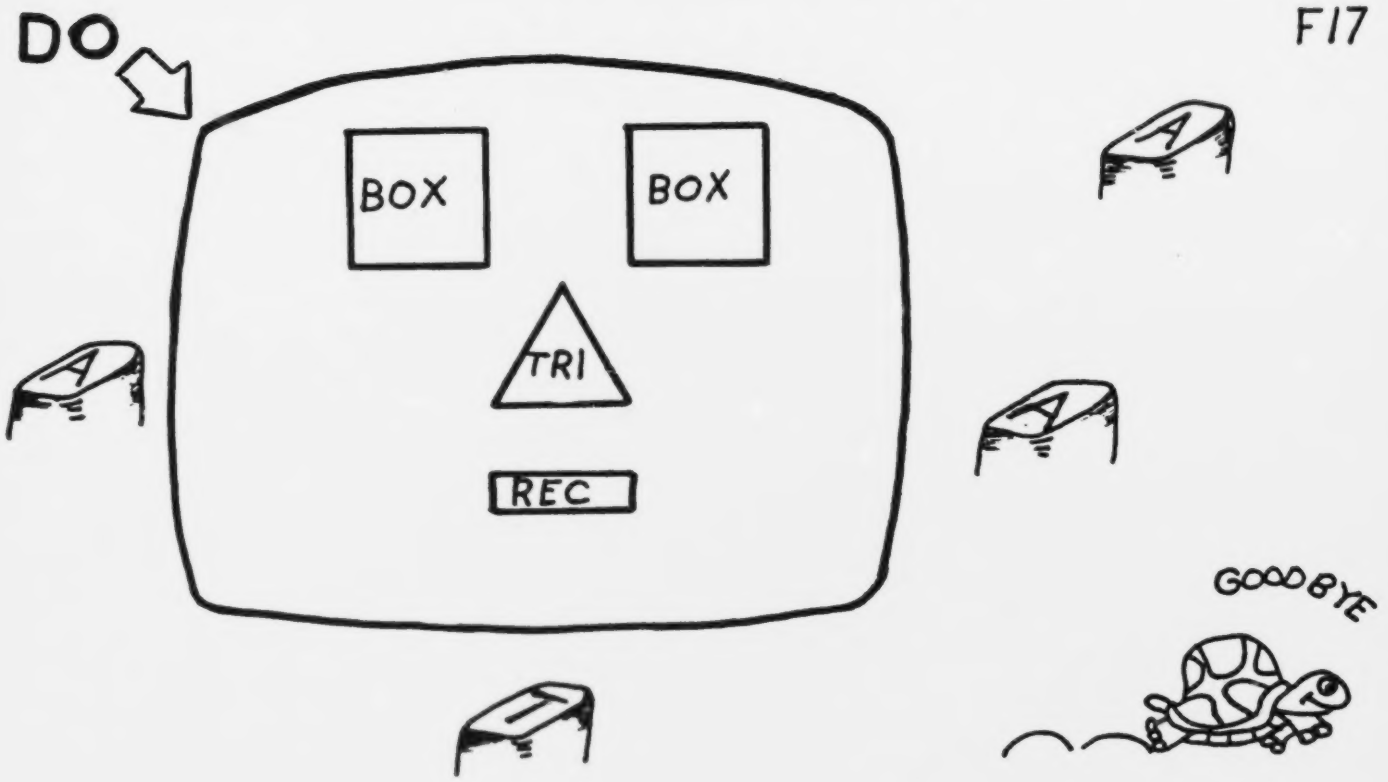
F16



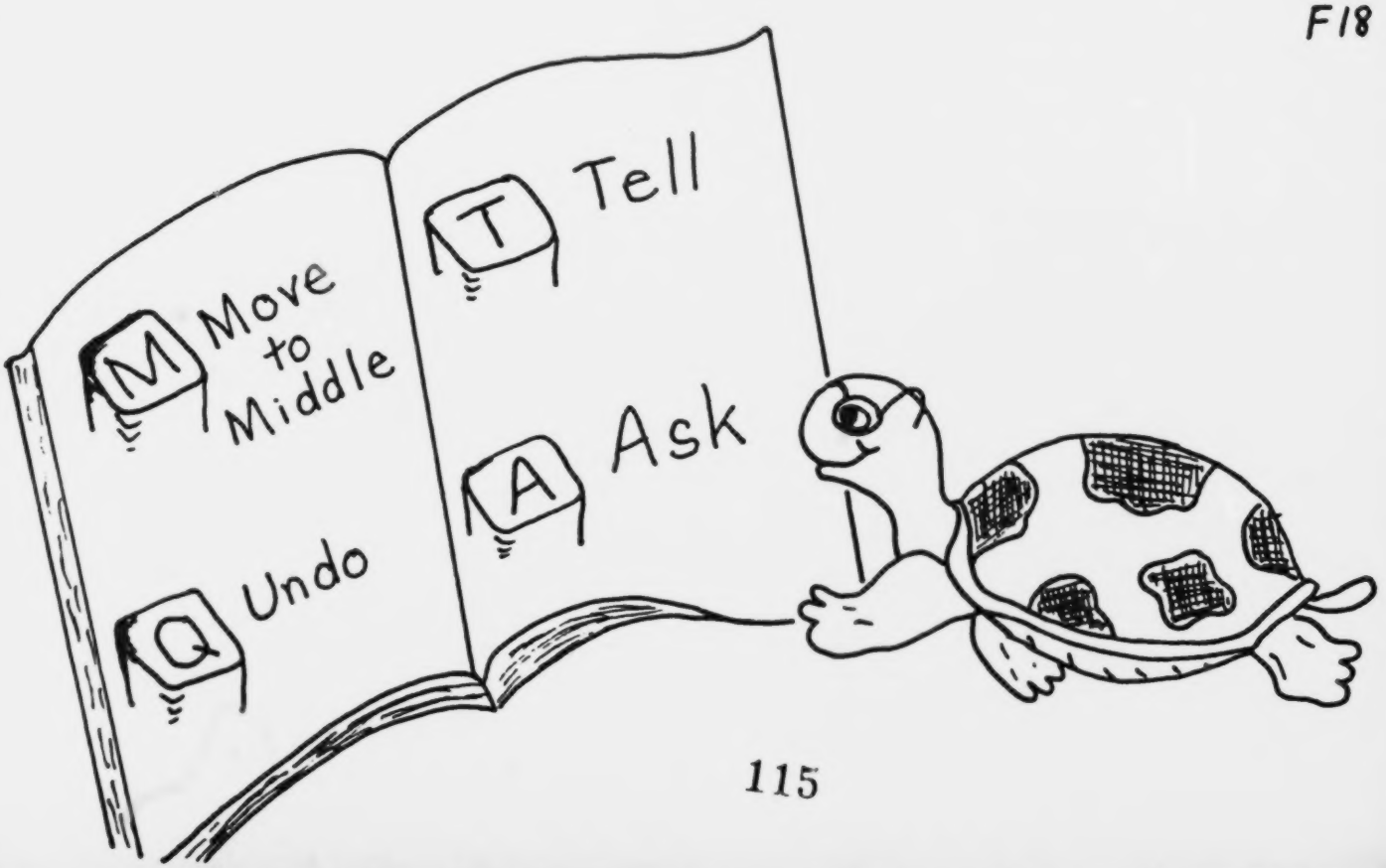
Tell

Ask

F17


DO
BOX
BOX
TRI
REC
A
A
A
A
GOOD BYE

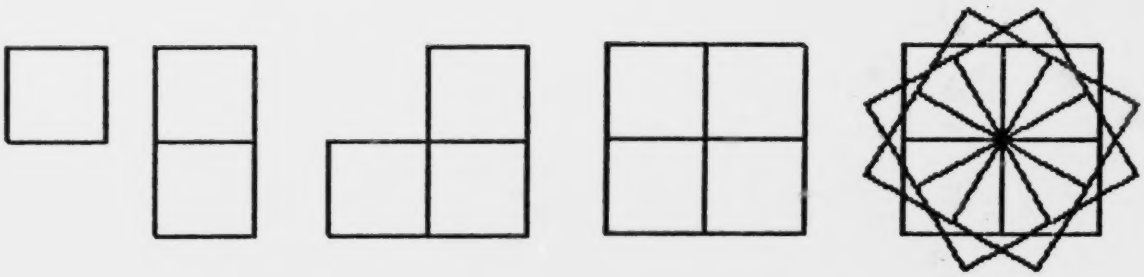
F18


T Tell
M Move to Middle
A Ask
Q Undo

G1

Can you do this?

1 2 3 4 5



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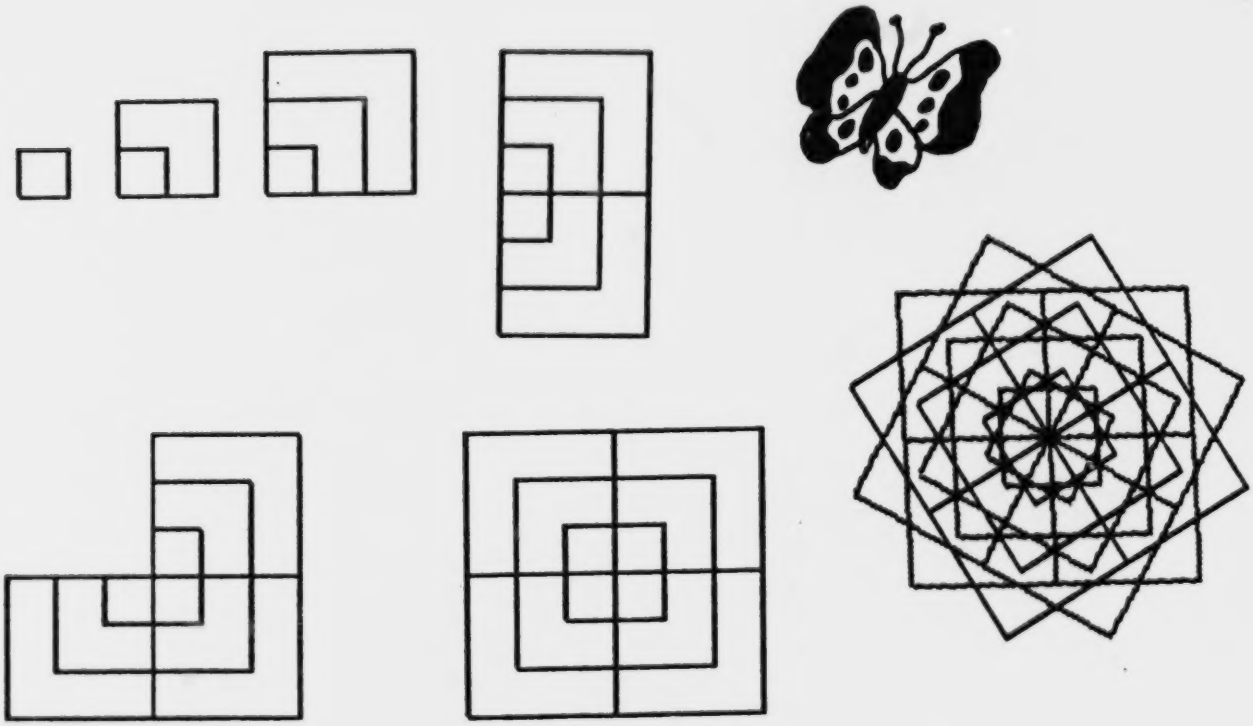

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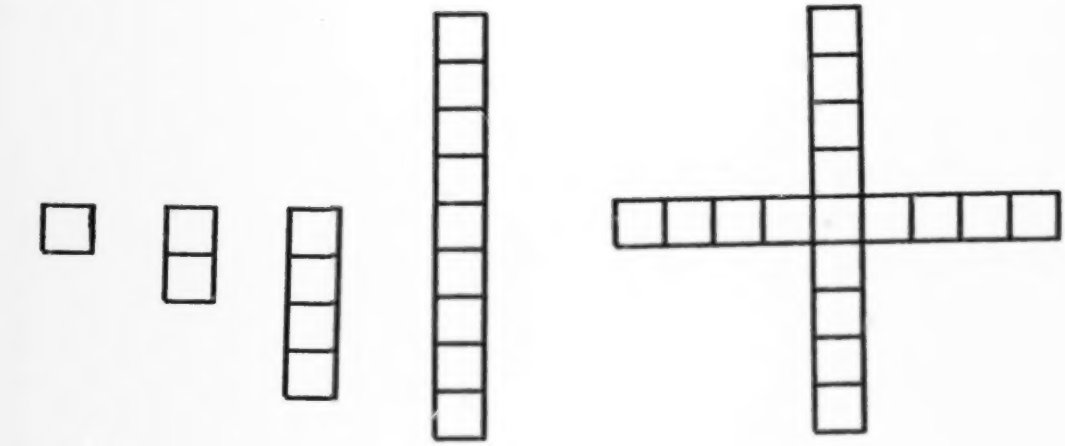

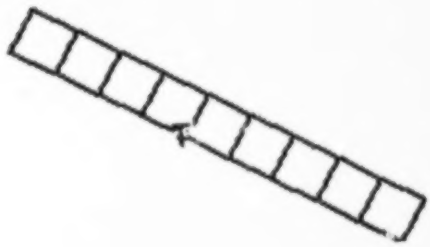

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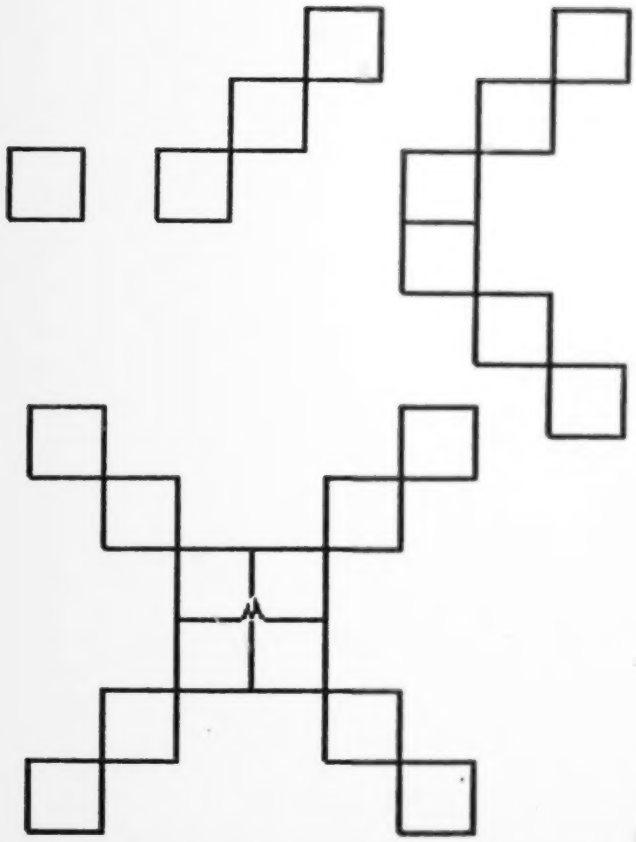

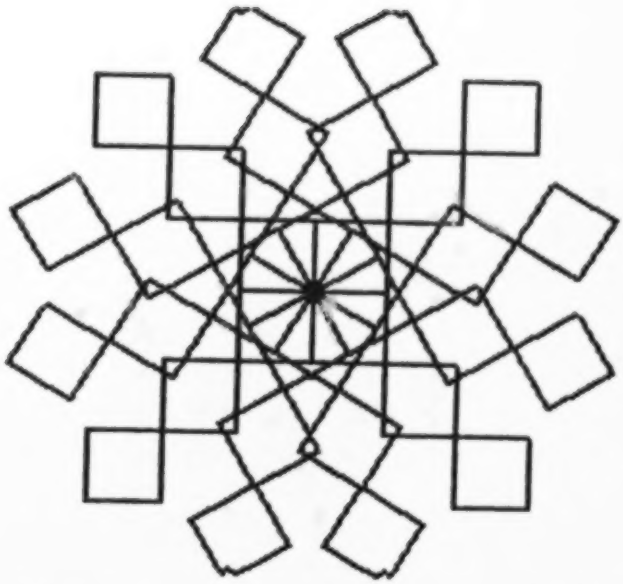

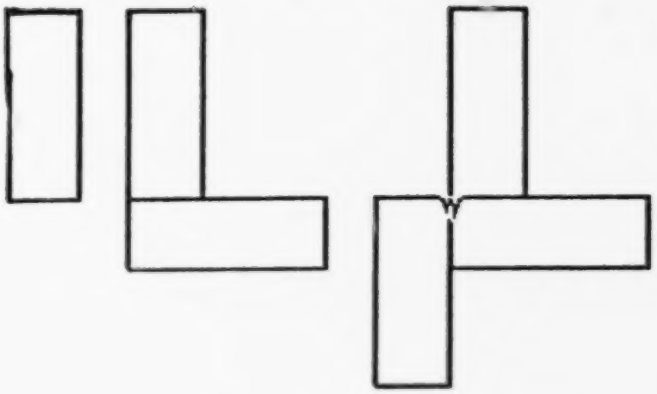

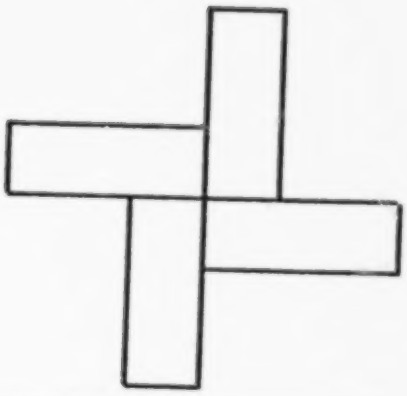

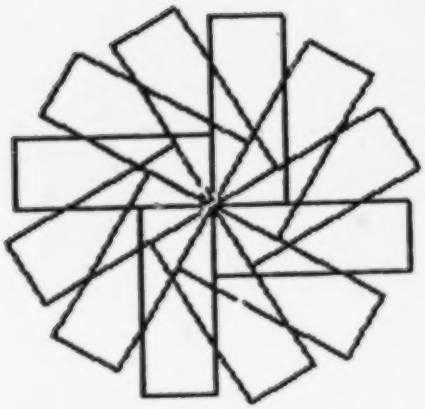

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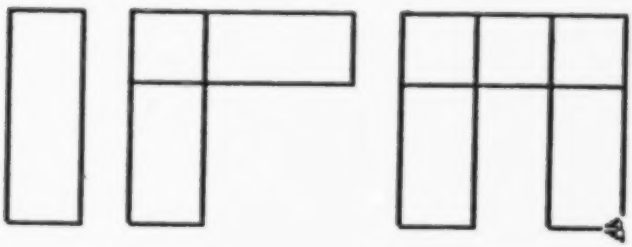

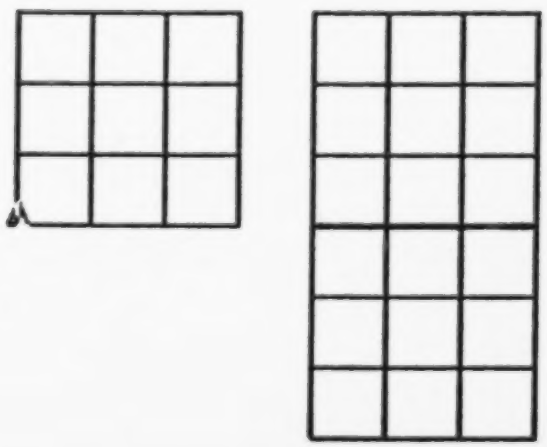

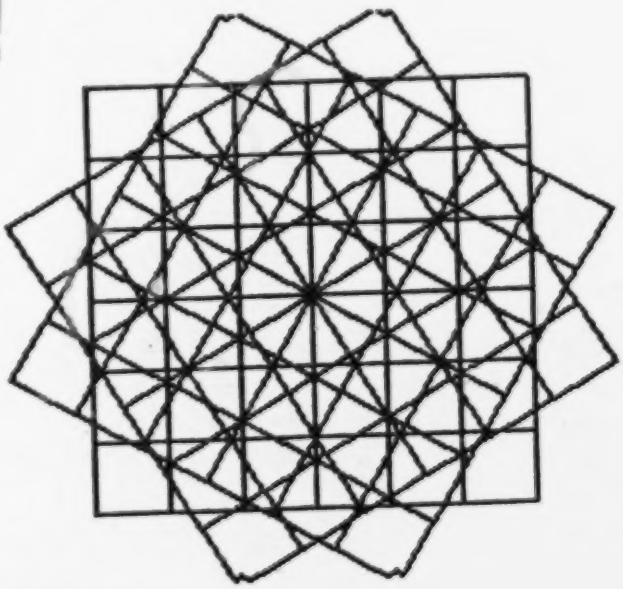

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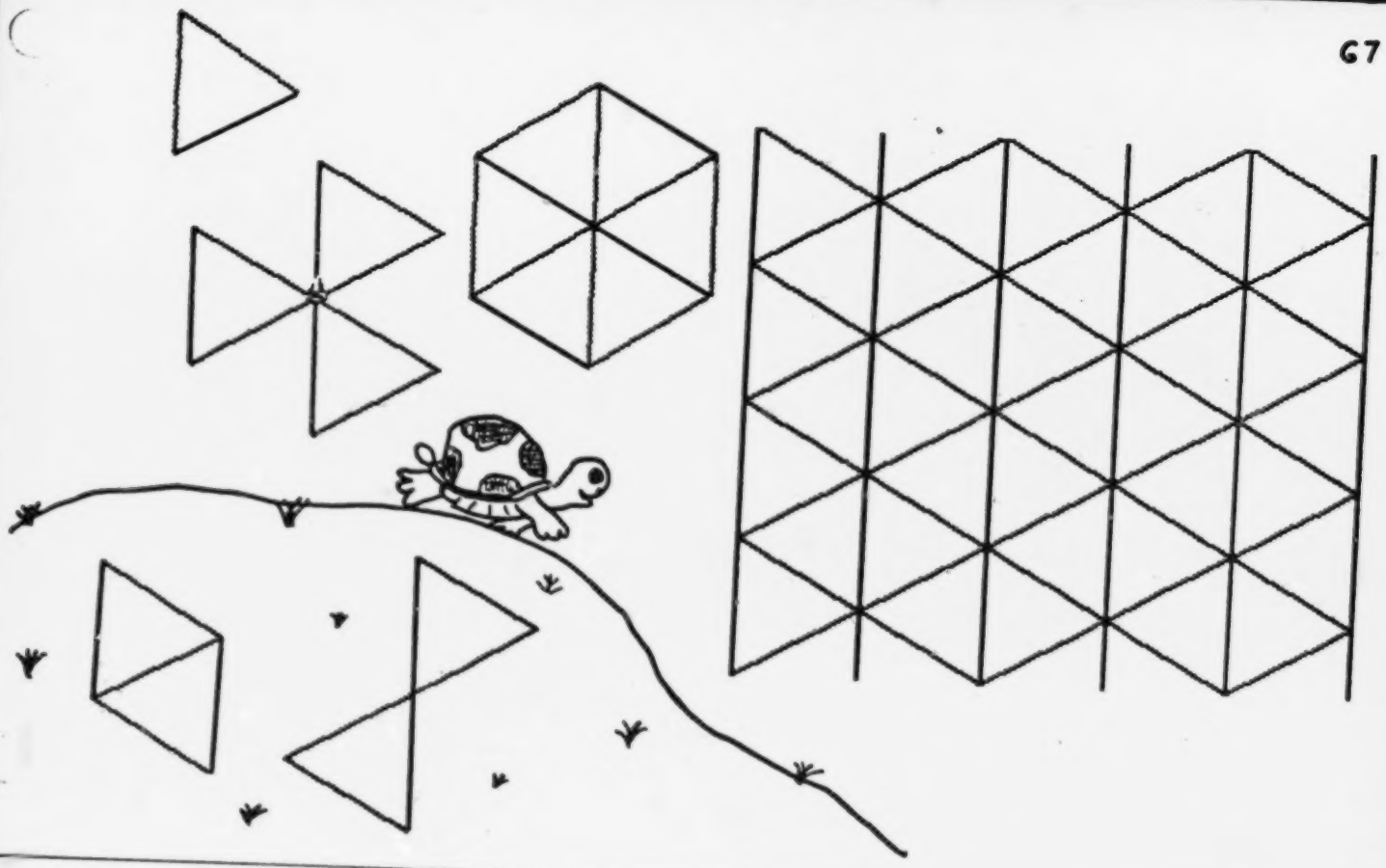

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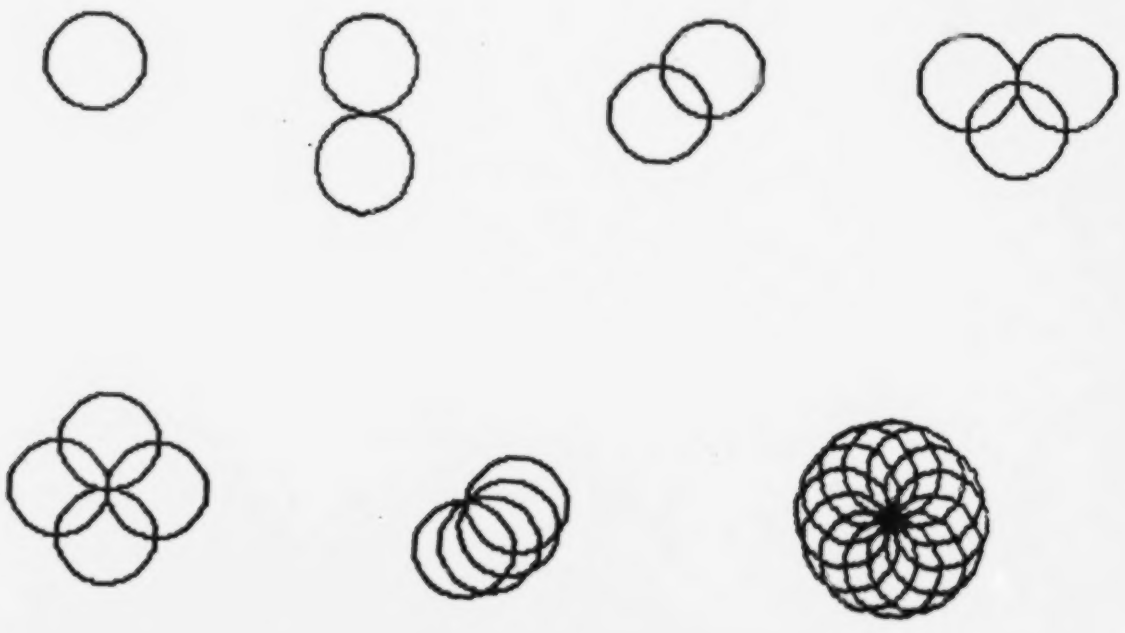

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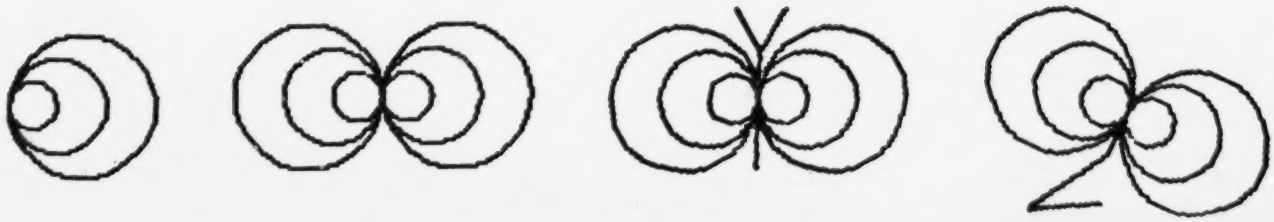
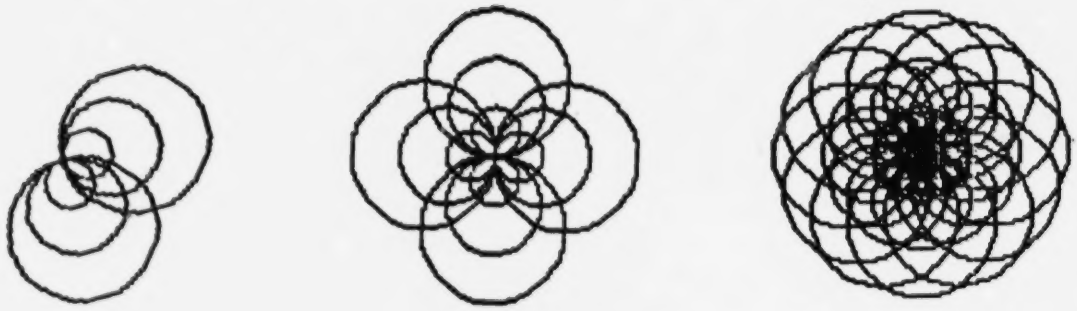
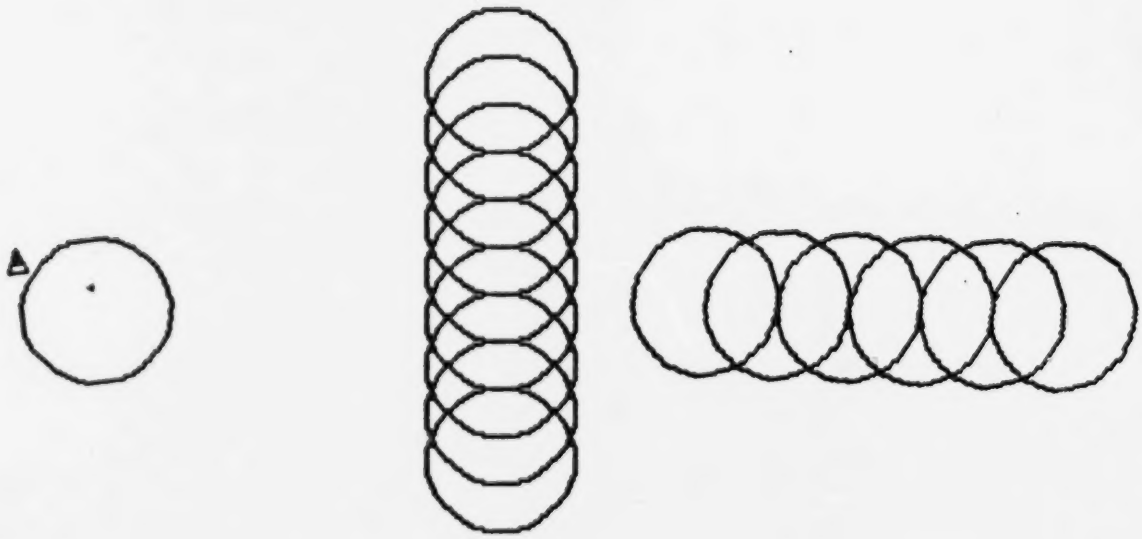
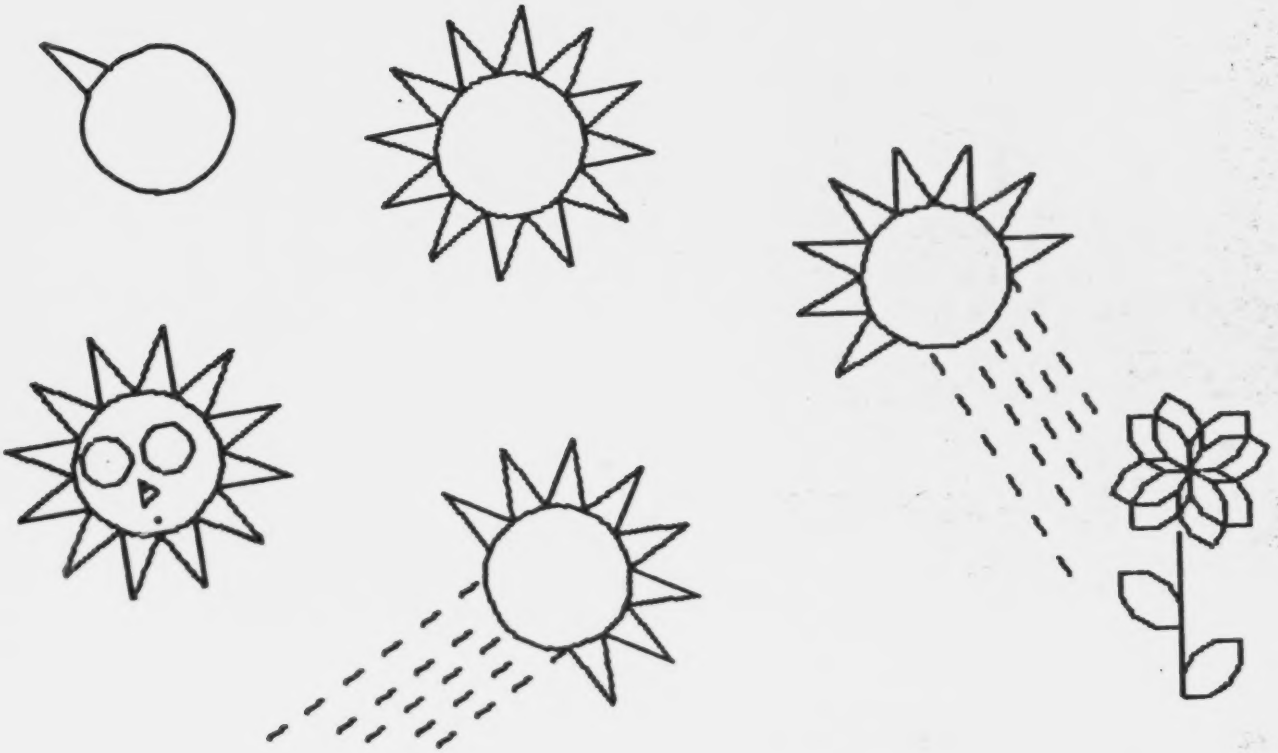




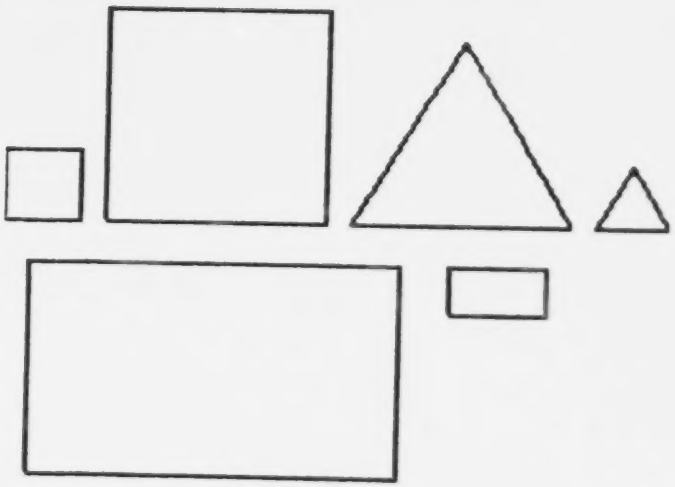
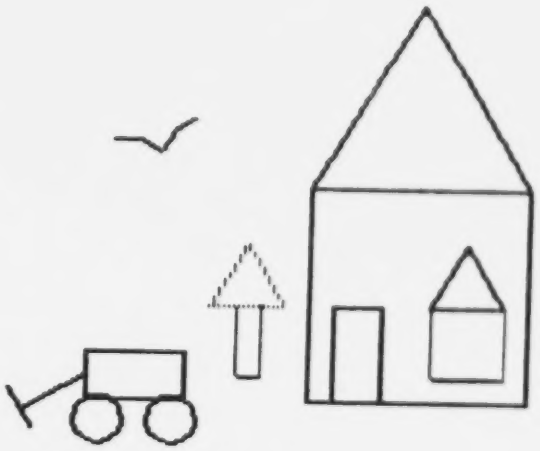
G10



G 11



G12



GOODBYE